THE MODERATING EFFECT OF TRAIT ANXIETY ON PHYSIOLOGICAL AROUSAL IN COPING WITH RACIAL DISCRIMINATION

A Dissertation in

Counselor Education

by

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Submitted in Partial Fulfillment of the Requirements for the Degree of

Doctor of Philosophy

August 2019
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ABSTRACT

Trait anxiety is the temperamental dimension of neuroticism and is found to play a vital role in individuals’ responses to stressors such as racial discrimination. Among minority populations, racial discrimination is recognized as a unique psychological stressor that is associated with adverse health outcomes. Past studies have reported effects of different coping strategies in response to racial discrimination. However, mixed results regarding the effectiveness of coping strategies have begun to call into scholarly attention to the effect of individual factors such as trait anxiety on coping with racial discrimination as well as the importance of studying specific coping strategies. This study presents an experimental study using physiological recordings to examine the moderating effect of trait anxiety in the effectiveness of two coping strategies (passive acceptance vs. confronting) for racial discrimination. Data analyses revealed that the effectiveness of coping (i.e., confronting and passive acceptance) differed by trait anxiety and different coping periods (i.e., coping period and recovery period). Specifically, during the coping period, confronting led to attenuated physiological activation whereas passive acceptance led to enhanced physiological activation for individuals with increasing trait anxiety. During the recovery period, coping was less effective for individuals with increasing trait anxiety than those with less trait anxiety in facilitating emotional recovery.
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The Moderating Effect of Trait Anxiety on Physiological Arousal in Coping with Racial Discrimination

Chapter 1

Introduction

A common source of stress in many communities, racism is defined as “the beliefs, attitudes, institutional arrangements, and acts that tend to denigrate individuals or groups because of phenotypic characteristics or ethnic group affiliation” (Clark, Anderson, Clark, & Williams, 1999, p.805). Racial discrimination refers specifically to giving unfair treatment to someone based on the recipient’s racial/ethnical background (Harrell, 2000) and often manifests in either everyday experiences (e.g., minority individuals being followed in stores) or major life events (e.g., unfair treatment of certain racial groups by law enforcement officers; Soto, Dawson-Andoh, & BeLue, 2011). Past research has revealed associations between experiences of racial discrimination and adverse psychological, cognitive, physical, and behavioral outcomes (Bair & Steel, 2010; Brody et al., 2006; Gibbons, O’Hara, Stock, Gerrard, Weng, & Wills, 2012; Salvatore & Shelton, 2007). Moreover, racial discrimination has been recognized as a significant, and possibly unique, psychosocial stressor with negative health consequences (Mellor, 2004; Slopen & Williams, 2014).

When facing racial discrimination, individuals make cognitive and behavioral efforts to regain inner balance to resolve problems caused by this stressor (Mellor, 2004). These cognitive and behavioral efforts are known as coping strategies (Mellor, 2004; Zautra, Sheets, & Sandler, 1996). Confronting, a commonly studied coping strategy, consists of anger expression and/or direct communication with the individuals or groups making biased assertions or engaging in biased actions (Forsyth & Carter, 2012). Past studies of the effectiveness of confronting in
response to racial discrimination have produced inconsistent results. While some researchers (e.g., Dover, Major, Kunstman, & Sawyer, 2015; Sanchez, Himmelstein, Young, Albuja, & Garcia, 2016) have shown that confronting buffers some adverse results of racial discrimination, others have found associations between frequent use of confronting and additional adjustment issues such as higher levels of anxiety and depression compared to those who did not use confronting (e.g., Park, Wang, Williams, & Alegría, 2017, 2018); meanwhile, still others (e.g., Noh, Beiser, Kaspar, Hou, & Rummens, 1999; Sanchez, Himmelstein, Young, Albuja, Garcia, 2016) have noted that confronting does not affect the relationship between racial discrimination and depression or physical health.

If confronting is considered a direct strategy for coping with racial discrimination, the opposite of this strategy would be passive acceptance, an indirect coping strategy. According to Cross (1971)’s Black Identity Development Theory, minority individuals who adopt passive acceptance are either unaware of or deny the racial discrimination they experience. Alongside confronting, researchers have recognized passive acceptance as a frequently used response for coping with discrimination (Lee, Soto, Swim, & Bernstein, 2012; Swim, Eyssell, Murdoch, & Ferguson, 2010). Although few studies have examined the effectiveness of passive acceptance, existing research on indirect coping strategies has yielded mixed results. Some investigators (e.g., Forsyth & Carter, 2012; Smith, Stewart, Myers, & Latu, 2008) have noted that indirect coping strategies such as bargaining (i.e., “cognitive efforts to make sense of the experience; to manage thoughts about the incident; to examine one’s own responsibility in bringing the incident about; and to change one’s behavior to manage other’s perceptions” Forsyth & Carter, 2014; p. 636) and avoidance can lead to higher levels of anxiety and depression; meanwhile, others (e.g., Hyers, 2007; Noh et al., 1999) have highlighted the protective effects of such strategies.
One possible explanation for the mixed findings produced by previous studies of coping with racial discrimination is individual differences that might affect the coping process. Specifically, confronting might lead to greater adverse psychological symptoms if it results in increased interpersonal conflicts that individuals prefer to avoid (Brondolo et al., 2009; Hyers, 2007). Meanwhile, passive acceptance might protect those who believe they should avoid social disruption (Noh et al., 1999). Indeed, researchers (e.g., Mendoza-Denton, Downey, Purdie, Davis, & Pietrzak, 2002; Brondolo et al., 2009) have highlighted the importance of examining individual differences, especially personality traits, when considering the effectiveness of various coping strategies. Among relevant personality traits, researchers have focused increasing attention on the effects of trait anxiety, which appears to play a vital role in individual responses to stress.

Trait anxiety refers to “the stable tendency to attend to, experience, and report negative emotions such as fears, worries, and anxiety across many situations” (Gidron, 2013, p. 1989). Research has shown that trait anxiety is an established risk factor for anxiety disorders, posttraumatic stress symptoms, depression, hypertension, chronic smoking, and coronary heart disease (Chida & Steptoe, 2009; Glotzbach-Schoon et al., 2013; Hernandez et al., 2014; Weems, Pina, Costa, Watts, Taylor, & Cannon, 2007, Wiggert, Wilhelm, Nakajima, & al’Absi, 2016). When coping with stress, high trait-anxious individuals are more likely to develop heightened psychophysiological stress activity (Crowley et al., 2011) and face a higher risk of developing maladaptive coping strategies (Tuncay, Musabak, Gok, & Kutlu, 2008; Villada, Hidalgo, Almela, & Salvador, 2016) than low trait-anxious individuals. Even when applying adaptive coping strategies such as appraisal, higher trait-anxious individuals often require more mental effort than lower trait-anxious individuals (Campbell-Sills, Simmons, Lovero, Rochlin, Paulus,
& Stein, 2010). These findings highlight the need for research examining the effects of trait anxiety on coping with stressors, especially unique psychosocial stressors such as racial discrimination.

Acknowledging the association between individual differences in trait anxiety and strategies for coping with stress, and recognizing that minorities commonly cope with racial discrimination through either confronting or passive acceptance, the present study investigated the moderating role of trait anxiety on the effects of these two strategies for coping with racial discrimination. Importantly, the impact of implementing each type of response strategy in the face of racial discrimination was captured by measuring self-reported emotional responses as well physiological arousal.

**Statement of the Problem**

Racial discrimination has long been recognized as a significant psychosocial stressor that produces negative health consequences. Researchers including Brondolo et al. (2009) have urged scholars to investigate the differential effects of specific coping strategies on individuals’ well-being. Given that coping with discrimination involves a vast array of possible behaviors, ranging from passive acceptance to confronting (Louis & Taylor, 1999) and that confronting and passive acceptance are two commonly used responses for coping with discrimination (Lee et al., 2012; Swim et al., 2010), this study examined the effects of passive acceptance and confronting as the endpoints of the coping response continuum to establish a clear understanding of the effectiveness of these two maximally different approaches.

Additionally, individual differences, particularly related to trait anxiety, in coping processes might explain the mixed findings produced by past studies of the effects of strategies for coping with racial discrimination. Trait anxiety is the temperamental dimension of
neuroticism (Gidron, 2013, p. 1989) and is associated with emotional dysregulation (Marzi, Regina, & Righi, 2014), mortality from cardiovascular diseases (Chida & Steptoe, 2009), posttraumatic stress disorder (PTSD; Hensley & Varela, 2008), and poor health-related quality of life (Ristvedt & Trinkaus, 2009). In addition to the higher risk of developing adverse health outcomes, high trait-anxious individuals also show higher levels of cognitive biases toward potentially threatening stimuli than low trait-anxious individuals (Mathews & MacLeod, 2005) and they tend to respond with more intense situational anxiety (Cristea, Valenza, Scilingo, Szentágotai Tátar, Gentili, & David, 2014; Horikawa & Yagi, 2012; Spielberger, 1966). High-trait anxious individuals also often have more maladaptive cardiovascular responses to psychological stress than low trait-anxious individuals (Gonzalez-Bono, Moya-Albiol, Salvador, Carrilo, Ricarte, & Gomez-Amor, 2002; Miu, Heilman, & Miclea, 2009), which could lead to adverse cardiovascular health outcomes in the long-run.

Moreover, individuals with higher trait anxiety who frequently encounter stressful situations have increased risks of developing maladaptive or ineffective coping strategies to reduce situational anxiety. Previous studies examining the association between trait anxiety and coping strategies have shown that individuals with higher trait anxiety are more likely to employ less adaptive coping strategies such as venting and less mental engagement (Fatima & Tahir, 2013; Villada et al., 2016), which could potentially elevate rather than regulate anxiety. Research has also shown that trait-anxious individuals who frequently use maladaptive coping strategies (e.g., avoidance, suppression) display more negative affect (Amstadter, 2008; Borkovec, Alcaine, & Behar, 2004; Campbell-Sills, Barlow, Brown, & Hofmann, 2006). Such elevated emotional arousal in response to different elicitors might exacerbate the risk of developing
maladaptive coping strategies (e.g., substance abuse) among trait-anxious individuals as they struggle to alleviate their distress.

Considering that how individuals appraise “(consciously or unconsciously) the significance of a harmful, threatening, or challenging event” (Mellor, 2004, p.56) determines their responses to psychosocial stress, individual variations in trait anxiety, where attention to threat is heightened and avoidance coping might be preferred, might influence how individuals appraise stressful events or situations. Consequently, variability in trait anxiety can affect how individuals respond to psychosocial stressors such as racial discrimination, potentially influencing the selection of coping strategies and their subsequent effectiveness.

Although a significant number of studies have documented the association between trait anxiety and stress-coping strategy preferences, as well as the effects of coping strategies on individuals with anxiety, research on the effectiveness of coping specifically with racial discrimination among trait-anxious individuals remains scarce. Some coping strategies that are effective under stressful circumstances may even be maladaptive for high trait-anxious individuals if used to deal with stressors such as racial discrimination. For example, although trait-anxious individuals prefer to use mental disengagement when facing stressful situation (Villada et al., 2016), employing such strategy might be particularly problematic in discriminatory contexts because it might lead to adverse mental health outcomes (West, Donovan, & Roemer, 2010). The uniqueness of racial discrimination as a stressor makes examining the effectiveness of the strategies trait-anxious individuals use to cope with racial discrimination crucial. Such research could provide insights that would help trait-anxious individuals cope with such adversity and enhance their resiliency.
**Purpose of the Study**

Recognizing the minimal scholarly attention paid to the moderating role of trait anxiety in evaluating the effectiveness of different racial discrimination coping strategies, this study tested whether trait anxiety moderated the effects of confronting vs. passive acceptance on emotional and physiological responses to racial discrimination. Specifically, by experimentally inducing racial discrimination and randomly assigning participants to two different coping strategies, the study assessed how trait anxiety moderated participants’ physiological responses to racial discrimination after participants employed one of the two coping strategies. It is hoped that the results of this research will add to existing studies of the importance of individuals’ trait anxiety in coping with racial discrimination and facilitate clinical insights regarding individual-based variations in the effectiveness of certain strategies for coping with racial discrimination.

**Research Questions and Hypotheses**

Previous studies have documented the positive correlation between racial discrimination and anxiety and highlighted the uniqueness of racial discrimination as a psychosocial stressor; however, how different levels of trait anxiety influence individual responses to racial discrimination remains unclear. Therefore, the primary aim of this study was to examine whether the effectiveness of strategies for coping with racial discrimination varied among individuals with different levels of trait anxiety. A secondary aim was to examine whether people with different levels of trait anxiety have different physiological and emotional responses to racial discrimination. To answer these questions, participants with different levels of trait anxiety completed a speech task that introduced an active stressor, modeled from previous studies of coping among trait-anxious individuals (e.g., Cho, Hanley, Yang, & Soto, in press).
After completing the speech task, participants received racially discriminatory feedback, which they then addressed using their assigned coping strategies. Self-reported affect as well as recorded physiological responses were assessed before and after the task, and during the recovery period (see study procedures). Physiological responses were recorded to measure two branches of autonomic nervous system (ANS) reactions—sympathetic and parasympathetic. Specifically, the sympathetic system controls restoration, while the parasympathetic system manages mobilization (Sperry, Kwapil, Eddington, & Silvia, 2018).

**Hypothesis 1.** Past studies of anxiety disorders and physiological activity have linked increased anxiety to more intense situational stress in stressful situations (Cristea et al., 2014; Holwerda et al., 2018; Staples-Bradley, Treanor, & Craske, 2018). Building on these studies, it is expected that individuals with higher levels of trait anxiety will exhibit increased sympathetic activity and decreased parasympathetic activity (i.e., higher physiological arousal), as well as increased self-reported negative affect after receiving racially discriminatory feedback.

**Hypothesis 2.** As previously mentioned, confronting might not be effective for those who tend to avoid interpersonal conflicts (Hyers, 2007). Considering that high trait-anxious individuals tend to perceive stressful situations as threatening and may thus have elevated physiological responses, it is expected that, in the confronting condition, high trait-anxious individuals will be more likely to experience stress and higher physiological arousal than low trait-anxious individuals. On the other hand, because passive acceptance can help individuals avoid interpersonal conflicts and other stressful situations, high trait-anxious individuals might be more comfortable than low trait-anxious individuals in the passive acceptance condition (Brondolo et al., 2009; Hyers, 2007). Based on these research findings, it is hypothesized that, in the confronting condition, individuals with increasing trait anxiety will exhibit enhanced
physiological activity and self-reported affect than individuals with lower trait anxiety during the recovery period. In the passive acceptance condition, individuals with increasing trait anxiety will exhibit attenuated physiological activity self-reported affect than individuals with lower trait anxiety in recovery.

Definitions of Terms

**Trait anxiety.** Trait anxiety refers to “the stable tendency to attend to, experience, and report negative emotions such as fears, worries, and anxiety across many situations” (Gidron, 2013, p. 1989).

**Racial discrimination.** Racial discrimination refers to giving unfair treatment to someone based on the recipient’s racial/ethnical background (Harrell, 2000) and often manifests in either everyday experiences (e.g., people act as if certain racial groups are inferior and treat such groups with less respect) or major life events (e.g., unfair treatment of certain racial groups by law enforcement officers; Soto, Dawson-Andoh, & BeLue, 2011).

**Confronting.** In stress literature, confronting racial discrimination is defined as the active expression of “one’s dissatisfaction with racial discriminatory behavior to the sources of the discrimination” (Sanchez et al., 2016, p. 2000). It consists of expressions of anger and direct challenges to perpetrators of racial discrimination (Forsyth & Carter, 2012).

**Passive acceptance.** According to Cross (1971)’s Black Identity Development Theory, minority individuals who adopt passive acceptance are either unaware of or deny the racial discrimination they experience even when the unfairness or discrimination is quite real. Such individuals usually accept the dominant system and culture and tend to justify prejudice and discrimination (Downing & Roush, 1985).
Chapter 2

Literature Review

Racial Discrimination

**Prevalence.** Many researchers have found that certain minority groups in the United States typically experience elevated levels of racial discrimination. In a study of 743 racial minority adults, the majority of the sample (69%) cited a history of racial discrimination (Polanco-Roman, Danies, & Anglin, 2016). Similarly, more than half of the racial minority participants in a study of a multi-ethnic sample of 10,098 individuals reported experiencing everyday discrimination (i.e., racial discrimination that manifests in everyday experience, Burgess, Ding, Hargreaves, van Ryn, & Phelan, 2008).

In a study of 5899 participants from the National Study of American Life (NSAL), 40.6% of African American and 39.7% of Afro-Caribbean participants indicated that they had experienced race-based discrimination (Soto, Dawson-Andoh, & Belue, 2011). Likewise, 87% of African American youth and 90% of Caribbean Black youth in a study sample reported experiencing at least one discriminatory incident in the past year (Seaton, Caldwell, Sellers, & Jackson, 2008). Using data from the National Latino and Asian American Study (NLAAS), Pérez, Fortuna, and Alegría (2008) noted that the prevalence of perceived discrimination among Latinos in the United States was 30% and that 47% of U.S.-born Latino(a)s experienced day-to-day discrimination. While many believe that current views of Asian Americans as the “model minority” make them less likely to experience racial discrimination (Sue & Sue, 2013), researchers have challenged this belief and found that a high proportion of Asian Americans have also experienced racial discrimination. For instance, 78% of participants in a study of 152
Asian Americans indicated that they experienced some form of racial discrimination within the two-week study period (Ong, Burrow, Fuller-Rowell, Ja, & Sue, 2013).

**Impacts of racial discrimination.** Beyond focusing on the prevalence of racial discrimination experienced among racial minority groups, scholars have increasingly analyzed the relationship between racial discrimination and adverse psychological, cognitive, physical, and behavioral outcomes. Studies have consistently linked experiences of racial discrimination to negative psychological outcomes for ethnic/racial minority populations over time, including lower self-esteem (Greene, Way, & Pahl, 2006), lower job satisfaction (Miller & Travers, 2005), a higher level of stress (Miller & Travers, 2005), increased negative emotions experienced in daily lives (Broudy et al., 2007), and poorer mental health status (Gee, Ryan, Laflamme, & Holt, 2005; Larson, Gillies, Howard, & Coffin, 2007; Sellers, Bonham, Neighbors, & Amell, 2009; Sujoldžić, Peternel, Kulenović, & Terzić, 2006). Since experiences of racial discrimination constitute a significant component of racial minority populations’ daily lives, these chronically stressful experiences inevitably lead to higher risks of developing more severe mental health issues among these populations. Indeed, research has shown that frequent exposure to racial discrimination can lead to increased depression and anxiety symptoms (Banks, Kohn-Wood, & Spencer, 2006; Noh, Kaspar, & Wickrama, 2007; Wagner & Abbott, 2007), increased substance abuse (Bennett, Wolin, Robinson, Fowler, & Edwards, 2005; Choi, Harachi, Gillmore, & Catalano, 2006; Gee, Delva, & Takeuchi, 2007), and a higher risk of developing conduct problems, schizophrenia, and other psychiatric disorders (Brody et al., 2006; Gee, Spencer, Chen, Yip, & Takeuchi, 2007; Oppdal, Røysamb, & Heyerdahl, 2005; Veling, Selten, Susser, Laan, Mackenbach, & Hoek, 2007).
In terms of cognitive outcomes, studies have found close links between frequent exposure to racial discrimination and cognitive impairments (Bair & Steele, 2010; Salvatore & Shelton, 2007). Specifically, due to the need for constant affect-regulation, engaging in interracial interactions (e.g., talking to a white individual) often negatively impacts ethnic/racial minority individuals’ cognitive functioning, regardless of whether the interactions involve racism. Such cognitive costs can later manifest in poorer performance on tasks related to executive functioning (Bair & Steele, 2010; Richeson & Shelton, 2003). In addition to the negative impacts of direct encounters with racism (e.g., receiving a racial slur), research has found that ethnic/racial minority individuals who experience racism indirectly (e.g., reading about a racial discrimination event) can also suffer cognitive impairment (Salvatore & Shelton, 2007).

In addition to negatively impacting cognition and psychological well-being, experiencing racial discrimination can also adversely impact physical health outcomes. Multiple cross-sectional studies have revealed positive correlations between racial discrimination and chronic health conditions and poor physical functioning among ethnic/racial minority individuals (Borrell, Kiefe, Williams, Diez-Roux, & Gordon-Larsen, 2006; Gee, Delva, & Takeuchi, 2007; Harris, et al., 2006; Larson et al., 2007; Piette, Bibbins-Domingo, & Schillinger, 2006). Other studies have linked experiences of discrimination to unhealthy blood pressure (Peters, Benkert, Dinardo, & Templin, 2007), poor sexual functioning (Zamboni & Crawford, 2007), higher nutrition risks (Locher, Ritchie, Roth, Baker, Bodner, & Allman, 2005), less stage 4 sleep and physical fatigue (Thomas, Bardwell, Ancoli-Israel, & Dimsdale, 2006), and a higher risk for breast cancer among Black women (Taylor et al., 2007).

As for behavioral outcomes, researchers have emphasized that racial discrimination shapes behaviors through stress. Several cross-sectional studies have reported that people who
experience racial discrimination often have an increased likelihood of using certain maladaptive coping behaviors, such as lifetime use of illicit drugs, increased cigarette smoking and alcohol use, and risky sexual behaviors (Borrell et al., 2007; Brook, Brook, Balka, & Rosenberg, 2006; Choi et al., 2006; Gee, Delva, & Takeuchi, 2007; Kalichman et al., 2006).

**Individual differences in experiencing racial discrimination.** Although experiencing racial discrimination can lead to negative health outcomes in general, research has indicated that a number of personal factors can influence individuals’ “vulnerability and resilience” (Henson, Derlega, Pearson, Ferrer, & Holmes, 2013; Williams & Mohammed, 2009). Nevertheless, relatively few studies have investigated individual differences as predictors of perceived discrimination and exposure to discrimination. Researchers have noted that individuals with lower self-esteem, poor self-efficacy, less personal control, less peer-popularity, low extraversion, frequent negative life events, or more agreeableness reported more perceived discrimination than others (Motti-Stefanidi & Asendorpf, 2012; Shorey, Cowan, & Sullivan, 2002).

Researchers have also highlighted the importance of studying individual factors that could mitigate the negative health consequences of racial discrimination. Some scholars have found that the adverse physical health impacts of racial discrimination only exist among individuals who adopt less adaptive coping styles (e.g., acceptance) or those with low trait anger (Clark, 2006; Clark & Gochett, 2006; Williams & Mohammed, 2009). Other possible moderators of the relationship between the exposure to racial discrimination and responses to racial discrimination include cognitive ability and social support (Utsey et al., 2006), level of race-based rejection sensitivity (RS-Race; Henson et al., 2013), and racial centrality (Bair & Steele, 2010). Specifically, research has shown that individuals with high cognitive abilities and social
support experience less stress in response to racial discrimination, whereas those with higher RS-Race are more likely to feel upset when subjected to racial discrimination (Henson et al., 2013; Utsey et al., 2006). Regarding racial centrality, researchers have found that individuals with high racial centrality experience more cognitive impairments when encountering racial discrimination (Bair & Steele, 2010).

**Coping with racial discrimination.** When facing racial discrimination, individuals will naturally use different coping strategies, either implicit or explicit. As previously mentioned, the continuum of coping strategies for discrimination ranges from passive acceptance to confronting (Louis & Taylor, 1999) and these two endpoints represent two distinct strategies. Confronting, a commonly used and widely studied strategy (Lee et al., 2012), is a direct response to sources of racial discrimination whereas passive acceptance, although not commonly examined, is an indirect response that individuals facing discrimination may employ (Swim et al., 2010).

Research has shown that these two strategies have vastly different effects. Many researchers have reported that confronting mitigates racial discrimination. It is noted ethnic minority individuals confronting the discrimination they face not only allows individuals to vent their emotions, but also prompts perpetrators to change their discriminatory behaviors or attitudes (Brondolo et al., 2009). Similarly, Dover and colleagues (2015) found that confronting is a more cardiovascular-adaptive response to discrimination than ignoring, self-blaming, or inhibiting anger. Other protective effects of confronting include lower blood pressure (Krieger & Sidney, 1996), greater psychological well-being and increased sense of autonomy (Sanchez et al., 2016), lower risk of developing depression (Noh et al., 1999), decreased probability of hypertension-related death and disability (Dorr, Brosschot, Sollers, & Thayer, 2007), and a greater sense of efficaciousness (Hyers, 2007). Although the positive effects of confronting
appear promising, some researchers have found that this strategy has no effects or that it can even produce negative outcomes. Both Gibbons et al. (2010, 2012) and Park et al. (2017, 2018) found that confronting can produce increased risk of poor mental health and behavior outcomes as well as more adjustment issues among Latino and African American individuals when it does not lead to resolution of racial discrimination. Similarly, Dorr and colleges (2007) reported that African Americans who coped with discrimination via confronting had slower systolic blood pressure recovery than those who inhibited their anger. Meanwhile, in a study based on multi-ethnic samples, Sanchez et al. (2016) reported that confronting had no effect on individuals’ physical health and Noh and Kasper (2003) likewise found that confronting racial discrimination had no effect on depression among South Asian individuals.

In contrast to the wealth of research on confronting, few studies have specifically examined the effectiveness of passive acceptance. Louis and Taylor (1999) found that individuals who used passive acceptance (not directly challenging discrimination) may be motivated by an internalized sense of blame and believe that directly challenging advantaged groups is counterproductive. This finding suggests that passive acceptance may resemble strategies such as avoidance, suppression, and self-blame in some respects—specifically, in the tendency to avoid directly challenging perpetrators of racial discrimination and taking responsibility for unfair treatment. Thus, to contribute to a broader understanding of the effectiveness of passive acceptance, this literature review also includes empirical findings regarding strategies that resemble passive acceptance.

Past studies of passive acceptance and other similar strategies have produced complex results. Some scholars have reported that these strategies negatively impact individuals’ health. Specifically, Hatzenbuehler, Nolen-Hoeksema, and Dovidio (2009) found that coping with racial
discrimination by suppressing emotions can lead to increased psychological distress. Similarly, in Forsyth and Carter (2012), individuals who used bargaining (i.e., rationalizing unfair treatment, self-blaming, and changing one’s behavior to alter others’ perceptions) reported more anxiety, depression, and hostility than those who used confronting. Studies have also shown that self-blame resulted in greater psychological distress (Smith, Stewart, Myers, & Latu, 2008).

On the other hand, some researchers have recognized that passive acceptance and other similar strategies can serve protective functions for individuals facing racial discrimination. In Noh and colleagues (1999)’s study of 647 South Asian refugees in Canada, participants who used passive acceptance actually reported decreases in depressive symptoms. Likewise, using a sample of 269 Latino adolescents, Park et al. (2018) found that participants who suppressed their anger when facing racial discrimination experienced fewer adjustment problems than those who used confronting.

Individual differences might explain these mixed findings regarding the effectiveness of confronting and passive acceptance (and other similar strategies). Researchers (e.g., Dorr et al., 2007; Hyers, 2007; Lee et al., 2012; Noh et al., 1999) have found that confronting might not benefit individuals who personally object to the strategy (e.g., confronting does not match their cultural values) or prefer to avoid interpersonal conflicts. For these individuals, passive acceptance appears more adaptive since it enables them to avoid challenging their beliefs or engaging in interpersonal conflicts. On the other hand, individuals who prefer direct challenges can bolster their feelings of autonomy via confronting and change the discriminatory behaviors of perpetrators (Mallett & Wagner, 2011; Part et al., 2017; Sanchez et al., 2016; Shelton, Richeson, Salvatore, & Hill, 2006). Meanwhile, Park and colleagues (2018) contended that suppression might be more beneficial than confronting (i.e., anger expression) since the ability to
flexibly suppress one’s emotions to meet contextual requirements signals individual sensitivity to context and has been linked to better adjustment outcomes (Bonanno & Burton, 2013). In sum, the effectiveness of confronting and passive acceptance seems to depend on individuals’ perceptions of these strategies’ consequences (especially whether they will lead to interpersonal conflicts or not) and accurate judgments of contexts.

Among various relevant individual differences, researchers have shown increasing interest in examining the effects of personality traits, particularly trait anxiety, in the process of coping with racial discrimination. Studies have suggested that individuals with high trait anxiety tend to use avoidance to cope with stressful situations (e.g., interpersonal conflicts) and have biased view of stressors (Marzi, Regina, & Righi, 2014; Mathews & Macleod, 2005; Villada et al., 2016). Thus, trait anxiety likely influences the effectiveness of confronting and passive acceptance. Indeed, Villada and colleagues (2016) noted that the differences in dispositional coping strategies only manifested between individuals with different levels of trait anxiety, highlighting the importance of trait anxiety in understanding responses to racial discrimination.

**Trait Anxiety**

Trait anxiety is “an emotional and behavioral disposition that predisposes individuals to perceive non-dangerous situations as threatening and to develop heightened fear reactions” (Spielberger, 1966, pp.16-17). Research has linked trait anxiety with increased emotional responses to threats and stress and identified it as a risk factor for the development and maintenance of anxiety disorders and adverse physical health outcomes such as cardiovascular diseases (Chambers, Power, & Durhan, 2004; Glotzbach-Schoon et al., 2013; Miu et al., 2009; Narita et al., 2007). When exposed to stressful stimuli (e.g., racial discrimination) or even relatively neutral conditions, individuals with high trait anxiety are more likely to develop high
state anxiety and employ maladaptive coping strategies than those with low trait anxiety (Barrell & Terry, 2003; Villada et al., 2016). Maladaptive coping strategies can lead, in turn, to problematic stress responses and ultimately produce negative health consequences (Villada et al., 2016).

**Trait anxiety and stress.** When encountering stressors, trait-anxious individuals display cognitive biases (Marzi, Regina, & Righi, 2014; Mathews & Macleod, 2005). Specifically, individuals with high trait anxiety are more likely to perceive ambiguous stimuli and situations as threatening than those with low trait anxiety (Bradley, Mogg, Falla, & Hamilton, 1998; Mathews & MacLeod, 2005). In addition, high trait-anxious individuals absorb more negative emotion triggers and tend to evaluate negative scenes as more negative and arousing (Marzi, Regina, & Righi, 2014). Thus, high trait-anxious individuals are more likely to perceive racial discrimination (Glotzbach-Schoon et al., 2013; Endler, Parker, Bagby, & Cox, 1991) and experience more elevated physiological arousal in response to stressors than low trait-anxious individuals.

However, past studies on physiological responses to stress have produced inconsistent findings. Some studies have reported that trait anxiety has no impact on individuals’ cardiovascular responses in stressful situations that are not discriminatory (e.g., Knepp & Friedman, 2008). On the other hand, others have shown that high trait-anxious individuals may evince blunted cardiovascular reactivity to stress and take longer than low trait-anxious individuals to recover from stress exposure (Gonzalez-Bono et al., 2002; Gramer & Sprintschnik, 2008). This particular combination (blunted reactivity and delayed recovery) can put individuals with high trait anxiety at greater risk for adverse health outcomes such as cardiovascular diseases. Moreover, Wiggert and colleagues (2016) argued that the reduced (i.e., blunted)
cardiovascular reactivity might result from stress response system malfunctioning, as chronic anxiety may lead to allostatic load, which refers to the state of frequent fluctuations of physiological responses due to exposure to chronic stress (McEwen & Stellar, 1993) and can cause maladaptive stress response patterns (McEwen, 2007). Such maladaptive stress response patterns can later induce ineffective and even maladaptive stress-coping strategies.

**Trait anxiety and coping.** Studies on chronic stress have indeed revealed associations between increased trait anxiety and maladaptive coping strategies such as venting and avoidance (Tuncay, Musabak, Gok, & Kutlu, 2008; Villada et al., 2016). In stressful situations such as exposure to racial discrimination, low trait-anxious individuals tend to actively engage in problem solving, whereas high trait-anxious individuals are more likely to employ strategies to restore psychological balance rather than solving problems directly (Villada et al., 2016).

Besides preferring maladaptive strategies, high trait anxious individuals may also face difficulties in applying strategies effectively. Effectively applying a coping strategy requires the utilization of cognitive executive function. However, trait-anxious individuals often have impaired executive cognitive control and deficits in working memory when under stress (Berggren & Derakshan, 2013; Marzi, Regina, & Righi, 2014). Moreover, research has shown that individuals with higher trait anxiety tend to remember more negative information than neutral information (Marzi, Regina, & Righi, 2014). Individuals with insufficient cognitive executive control and working memory are also more likely to have impaired attentional performance, which might in turn weaken their abilities to effectively employ coping strategies. Indeed, Campbell-Sills et al. (2010) found that applying adaptive strategies such as reappraisal requires greater mental engagement for high trait-anxious individuals than for low trait-anxious individuals, making it harder for the former to effectively apply these strategies.
Physiological Responses to Stress

When coping with stressors, individuals’ responsiveness involves multiple levels of physiological activation. In general, the sympathetic nervous system (SNS) controls human body activation and mobilization; in contrast, the parasympathetic nervous system (PNS) controls relaxation and restoration. SNS and PNS are two branches of the autonomic nervous system (ANS). Most changes in physiological states caused by stress are reflected in ANS activities (Karthikeyan, Murugappan, & Yaacob, 2012). Additionally, the use of different coping strategies also reportedly impacts physiological states. For example, low trait-anxious individuals who used a venting strategy to cope with a stressful task had decreases in PNS during recovery (Cho et al., in press).

With the increased use of physiological signals to measure stress response and coping, researchers have begun using impedance cardiography and respiratory sinus arrhythmia (RSA) to assess responses to stressful tasks among participants with anxiety (e.g., Cooper, Thayer, & Waldstein, 2013; Cho et al., in press). Research has shown impedance cardiography to be a reliable marker of sympathetic activity (SNS) in the ANS (Berntson, Cacioppo, Quigley, Fabro, 1994); the measures it produces—i.e., stroke volume (SV), left ventricular ejection time (LVET), pre-ejection period (PEP)—can also be used to represent sympathetic activity.

RSA reflects the degree of heart rate fluctuation due to respiration and has been conceptualized as an index of the PNS’s capacity to regulate arousal levels (Porges, 2007). Researchers have commonly used RSA reactivity as an indicator of the role of the PNS in instances of stress—deducible based on how much individuals’ RSA changes between a resting state and an engaged state (Bova, Kopp, & Fosco, 2015). A decrease in PNS activity, as indexed by decreases in RSA, often occurs in response to external stressors. This decrease in PNS is said
to reflect an ability to respond to stressors by allowing individuals to leave a resting state, increase heart rate, and use energy to attend to stressors. (Beauchaine, 2001; Porges, 2007). Studies have indicated that high anxiety is associated with higher RSA magnitude than low anxiety (Jönsson, 2007). Given that physiological responses can reflect stress responses and the effects of different coping strategies, this study examined psychophysiological data, using impedance cardiography to obtain relatively unbiased estimate of both PNS as well as SNS (the Apparatus Section in Chapter 3 provides additional relevant details).

**The Current Study**

Although researchers have extensively investigated racial discrimination, trait anxiety, and coping strategies, few have examined the effectiveness of specific coping strategies (i.e., passive acceptance vs. confronting) among trait anxious individuals responding to racial discrimination. To generate the knowledge and insights necessary to fill this gap in current research, the present study focused on how trait anxiety moderated the effects of two coping strategies and physiological responses to racial discrimination. In addition, to avoid the limitations of past studies, this study used an experimental design that included physiological measurement.

A review of current coping research indicates that the majority of past studies on racial discrimination had several methodological limitations. The first pertains to the use of self-report measures to examine individual responses to racial discrimination. Many studies have only relied on self-report data (e.g., Boynton, O’Hara, Covault, Scott, & Tennen, 2014; Levine, Himle, Abelson, Matusko, Dhawan, & Taylor, 2014) obtained from participants’ retrospective reports. Although this data collection method has clear advantages (e.g., being able to collect large amounts of data through online surveys), it can also introduce threats to validity (e.g., social
desirability response bias), which might lead to inconsistent research findings (e.g., regarding the effectiveness of certain strategies for coping with racial discrimination). Due to the limitations of self-reported measures, an increasing number of researchers have advocated the use more objective methods (e.g., physiological recordings) in measuring participants’ responses to stress (e.g., Jönsson, 2007; Thayer et al., 2000). Therefore, the present study used physiological method to measure participants’ responses to a discrimination-induction task.

The second methodological limitation in current coping research is related to experimental design. Multiple studies have attempted to use experimental designs to create lifelike discriminatory scenarios, but many of these studies have introduced racial discrimination to participants indirectly (e.g., Salvatore & Shelton, 2007). Although the indirect experience of racial discrimination may produce similar outcomes as actually experiencing racial discrimination, doing so still does not truly mimic the elements of the authentic experience of racial discrimination. Accordingly, this study used an experimental design with a lifelike task that required active engagement to induce a racially discriminatory situation. In addition, to examine the effects of two specific coping strategies (i.e., passive acceptance vs. confronting), this study integrated a recovery period at the end of the study procedures to record participants’ physiological responses after coping with the event.

In sum, the present study examined the effectiveness of coping strategies applied by racial minority individuals with different levels of trait anxiety by using an experimental design that mimicked elements of actual racial discrimination. To accurately capture the stress responses that the experiment stimulated, the study recorded participants’ physiological responses throughout. Additionally, a letter-writing task was also employed to mimic the actual process of adopting two strategies for coping with racial discrimination. The end of the study
included a recovery period to facilitate evaluation of the effectiveness of the coping strategies for individuals with different levels of trait anxiety.

The results of this study should provide empirical support for the effectiveness of certain coping strategies and elucidate the impact of discrimination on people with different levels of trait anxiety. Additionally, results will likely have clinical implications for practitioners working with trait-anxious people dealing with racial discrimination as well as those designing individual interventions based on different personality traits to mitigate the negative effects of racial discrimination.
Chapter 3

Methods

Participants

One hundred and twenty-five students from a large American university, recruited from the psychology student subject pool and listservs consisting of ethnic minority students, participated in this study. Participants recruited from the subject pool received course credit (1 credit per hour) as compensation and those recruited via listservs received $10 per hour. Pennsylvania State University’s Institutional Review Board (IRB) reviewed and approved the study.

Because this study aimed to examine the moderating role of trait anxiety in coping with racial discrimination, forty-nine participants who did not regard the feedback as racially discriminatory (39.2%) were excluded from data analysis. Through random assignment, thirty participants were placed in the confronting condition, and forty-six in the passive acceptance condition. However, nine participants who were assigned to passive acceptance conditions used confronting instead; and one participant who was assigned to confronting condition did not use either confronting or passive acceptance. As a result, the final sample included seventy-five participants, thirty-eight (50.7%) were in the confronting condition and thirty-seven (49.3%) were in the passive acceptance condition. Twenty-two (29.3%) were Black/African American, thirty (40.0%) were Asian/Asian American, seventeen (22.7%) were Latino/Latino American, and six (8.0%) were multiethnic. In terms of gender identity and age, eighteen (24%) participant identified as male and fifty-seven (76%) as women, and all were 18 years of age or older ($M=19.46$, $SD=2.11$). Tables 1a, 1b, and 1c present details regarding demographic information (i.e., race and gender) as well as the differences in assigned and actual conditions.
Table 1 a.

*Race and Changes in Assigned and Actual Conditions*

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Black (n = 22)</th>
<th>Asian (n = 30)</th>
<th>Latino (n = 17)</th>
<th>Multi (n = 6)</th>
<th>n (con)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Assigned</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confronting</td>
<td>7</td>
<td>13</td>
<td>4</td>
<td>5</td>
<td>29</td>
</tr>
<tr>
<td>Passive Acceptance</td>
<td>15</td>
<td>17</td>
<td>13</td>
<td>1</td>
<td>46</td>
</tr>
<tr>
<td>Total N = 75</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Actual</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confronting</td>
<td>14</td>
<td>9</td>
<td>9</td>
<td>6</td>
<td>38</td>
</tr>
<tr>
<td>Passive Acceptance</td>
<td>8</td>
<td>21</td>
<td>8</td>
<td>0</td>
<td>37</td>
</tr>
<tr>
<td>Total N = 75</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Assigned = Assigned Condition, Actual = Actual Condition, Black = Black/African American, Asian = Asian/Asian American, Latino = Latino/Latino American, Multi = Multiethnic, n (con) = number of participants for each condition

Table 1 b.

*Gender and Changes in Assigned and Actual Conditions*

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Male (n = 18)</th>
<th>Female (n = 57)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Assigned Condition</td>
<td>Confronting</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Passive Acceptance</td>
<td>10</td>
</tr>
<tr>
<td>2. Actual Condition</td>
<td>Confronting</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Passive Acceptance</td>
<td>10</td>
</tr>
</tbody>
</table>
### Table 1c.

**Gender and Race**

<table>
<thead>
<tr>
<th>Gender</th>
<th>Black (n = 22)</th>
<th>Asian (n = 30)</th>
<th>Latino (n = 17)</th>
<th>Multi (n = 6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>0</td>
<td>11</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Female</td>
<td>22</td>
<td>19</td>
<td>12</td>
<td>4</td>
</tr>
</tbody>
</table>

*Note. Black = Black/African American, Asian = Asian/Asian American, Latino = Latino/Latino American, Multi = Multiethnic.*

**Measures**

**Demographics.** The demographic questionnaire collected participants’ basic information, such as age, gender identity, and ethnic/cultural/racial identification. The questionnaire also asked participants whether they were bilingual and instructed those who answered yes to indicate their first and second languages and whether they were fluent in one or both languages. In addition, participants were asked to indicate their reading and writing proficiency levels in both English and, if applicable, the other specified languages. Information regarding participants’ language proficiency was collected because the study asked participants to give a speech and then write about the coping strategies they used in English. Lack of fluency in English could thus significantly influence the study results. Participants who indicated they could not read and write proficiently in English during the screening process were not included in the experimental portion of the study.

**The State-Trait Anxiety Inventory – Trait Version (STAI-T).** The STAI is a commonly used measure of trait and state anxiety (APA, 2017; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). This study assessed trait anxiety using the trait version of the STAI (STAI-T), which has 20 items for assessing how respondents generally feel (e.g., “I lack confidence,” “I feel secure”). All items are rated on a 4-point scale (1=almost never,
Item scores were added to obtain total scores; however, scoring was reversed for anxiety-absent items (e.g., “I feel secure”) (Julian, 2011). The STAI-T has a good test-retest reliability (average \( r = .88 \)) at multiple time intervals (Barnes, Harp, & Jung, 2002). Bieling, Antony, and Swinson (1998) correlated the STAI-T with the Beck Anxiety Inventory (BAI) and the Beck Depression Inventory (BDI) and reported that it had favorable convergent validity (\( r = .72 \) for BDI, and \( r = .42 \) for BAI). Moreover, multiple studies have found the STAI-T to be effective measuring trait anxiety in racial minority populations. For example, Fitzsimmons-Craft and Bardone-Cone (2012) reported that the STAI-T had good internal consistency (\( \alpha = .92/91 \)) for African American women. The total scores of trait anxiety for the current study sample (\( M = 46.27, SD = 9.97 \)) ranged from 28 to 72. A Kolmogorov-Smirnov test indicated that the total scores of trait anxiety followed a normal distribution, \( D (75) = .07, p = .11 \).

**Coping strategies.** Because methods for specifically measuring the likelihood of individuals using passive acceptance or confrontation when encountering racial discrimination have not yet been developed, this study used two subscales from two different established measures of coping with racial discrimination (Noh et al., 1999; Wei, Alvarez, Ku, Russell, & Bonett, 2010) The confrontation scale items were: (1) I respond by attacking others’ ignorant beliefs; 2) I get into an argument with the person; 3) I do not directly challenge the person; 4) I try not to fight with the person who offended me; and 5) I directly challenge the person who offended me. These 5 items were derived from the Resistance Subscale of Coping with Discrimination Scale designed by Wei et al. (2010). They defined resistance as challenging or confronting perpetrators of discrimination about their behaviors or opinions. The passive acceptance scale items were: (1) I take it as a fact of life; (2) I pretend I did not know I was
offended; (3) I ignore what happened to me; and (4) I do not react. These 4 items were derived from the passive acceptance subscale of a measure designed by Noh et al. (1999). All 9 of these items were measured using a 6-point scale (from 1 = never like me to 6 = always like me) and negative items on the confrontation scale were reverse coded. The Cronbach Alphas were .748 and .714 for the confrontation and passive acceptance scales respectively.

**State Affect Ratings.** Throughout the experimental portion of the study, participants were asked on multiple occasions to rate their current emotions, using on an 8-point Likert scale from 0=not at all to 8=very much. The emotions measured on this instrument included amusement, anger, annoyance, anxiety, boredom, contempt, contentment, disgust, embarrassment, fear, happiness, interest, relief, sadness, stress, and surprise. Past experimental studies have used these ratings to assess different emotions caused by active stressors (e.g., Soto, Levenson, & Ebling, 2005) with demonstrated effectiveness.

Ratings for anger, annoyance, anxiety, and stress were used to assess participants’ emotional response to racial discrimination. These are commonly studied among ethnic minority individuals in response to discrimination (Brondolo et al., 2009, Gibbons et al., 2010; Swim, Hyers, Cohen, Fitzgerald, & Bylsma, 2003). Annoyance was included because it is often used synonymously with anger. To analyze participants’ emotional responses to the racially discriminatory feedback, changes in emotions (i.e., anger, anxiety, stress, and annoyance) were calculated by comparing the pre-feedback baseline levels of anger and anxiety to the levels of anger and anxiety in the post-feedback baseline (i.e. post-feedback – pre-feedback). To assess participants’ emotional responses to the coping strategies they employed (i.e., recovery period), changes in these emotions were calculated by comparing post-feedback baseline levels of anger
and anxiety to the levels of anger and anxiety during the recovery period (i.e. recovery period – post-feedback baseline).

**Feedback evaluation.** Participants evaluated the feedback they received using a 5-point scale (0=not at all, 1=somewhat, 2=moderately, 3=very, and 4=extremely). The question that measured how racially biased the participants thought the feedback was (“To what extent was the feedback free of racial bias?”) was blended with nine other questions to reduce the possibility that the participants would detect the true purpose of the study. In addition, participants (n = 49) who selected ratings of 3 or higher for this question were not included in data analysis because such responses indicated they did not regard the feedback as racially discriminatory. Considering that the item was negatively worded, the ratings were reverse coded during data analysis.

**Apparatus**

**Audiovisual.** Participants were presented with the experimental materials and all procedural elements in the experimental portion on an 18-by-24-inch computer monitor. E-Prime© software was used to present the speech task and for the self-report measures.

**Physiology.** Participants’ physiological activities were measured using the Biopac© MP150 device, a microcomputer and an eight-channel polygraph that gather electrocardiography (ECG) and cardiac impedance data. ECG data were collected using three electrodes: positive, negative, and ground lead. The ground lead was placed at the bottom of the rib cage at the right mid-axillary line, the positive lead was placed at the bottom of the rib cage at the left mid-axillary line, and the negative lead was placed at the center of the right clavicle. Cardiac impedance data were collected using four electrodes: the first was placed at the fourth rib, the second was placed on the tip of the left clavicle to minimize artifact during speech, the third was attached around the fourth cervical vertebra on the back, and the last one was placed roughly at
the ninth thoracic vertebrae. Physiological data were collected with AcqKnowledge© software and were cleaned and analyzed using Mindware© software.

Derived from cardiac impedance signals and the ECG, pre-ejection period (PEP) and RSA were the primary outcome variables. PEP is the interval between the onset of the ECG-Q wave and the onset of left ventricular contraction (Andreassi, 2007, p.437). As sympathetic activity increases, PEP decreases. Thus, prior to analyzing physiological indicators of sympathetic arousal, PEP data were reverse coded.

To analyze participants’ physiological responses to the racially discriminatory feedback, RSA and PEP reactivity were calculated by comparing the average pre-feedback baseline RSA and PEP levels to post-feedback baseline RSA and PEP levels (i.e. post-feedback – pre-feedback). To assess the physiological responses to the coping strategies employed (i.e., recovery period), RSA and PEP reactivity were calculated by comparing the average post-feedback baseline RSA and PEP to the RSA and PEP levels during the recovery period (i.e. recovery period – post-feedback baseline).

Research Design

The present study used an experimental design with two conditions. Specifically, study participants were randomly assigned to either a confronting coping condition or a passive acceptance coping condition. Written responses were analyzed and revealed that some participants who were assigned to passive acceptance condition used confronting instead. As a result, more participants were assigned to passive acceptance to balance the final size of the samples under each condition. Participants’ reactions to and coping strategies for experiment-induced racially discriminatory feedback were evaluated. Physiological arousal was measured throughout the experiment. Participants in both conditions received the following racially
discriminatory feedback: “Hi, my name is Michael, I am the lead judge. Overall, we determined that your performance was worse than your peers’. But I wouldn’t feel bad about it, because I heard that you people typically do not do well on this type of task.” Participants who were assigned to use confronting to cope with this feedback were asked to write letters to the judges regarding how they felt about the feedback they received and suggesting ways to modify the feedback (“Now you have 3 minutes to write to the judges about your reactions to the feedback. You can write about how you feel about the feedback and what part of the feedback that you would like to change”). Meanwhile, participants assigned to the passive acceptance group were asked to write letters describing the feedback as fair and rationalizing the fact that they had received it (“Now you have 3 minutes to write a letter in which you need to state that you will accept the feedback and provide a rationale for why you think this feedback is fair”).

Researchers have previously used writing tasks to prompt participants to engage in specific racial discrimination coping strategies (e.g., Louis & Taylor, 1999); this approach has proven effective in regulating participants’ stress and emotions and in mimicking behavioral endorsement of coping strategies. The passive acceptance and confronting writing tasks were designed based on Louis and Taylor (1999)’s Understanding Behavioral Reactions to Discrimination theory. This framework defines confronting at the individual level as directly challenging discrimination by taking actions such as writing to a discriminatory person to confront racism. Additionally, in an experimental study of confronting as a strategy for coping with the racist statements of confederates, Lee et al. (2012) categorized participants’ confronting behaviors as directly asking racist colleagues about discriminatory comments, firmly expressing their opposition to said comments, trying to educate the colleagues about racism, and telling racist colleagues that the comments were offensive and wrong. As a result, the confronting task
in this study asked participants to write letters to the judges (comparable to the racist colleagues) regarding their reactions to the feedback.

Meanwhile, researchers have defined acceptance as a form of inaction (Louis & Taylor, 1999). Examples of accepting racial discrimination could involve writing to a friend and describing the discriminatory treatment as either fair (passive) or unfair (active). Therefore, the passive acceptance task in this study asked participants to write letters to the judges justifying and rationalizing the discriminatory feedback they received.

**Ethical Considerations**

To reduce social desirability response bias, the informed consent form did not specify the true purpose of the study; instead, it stated that the purpose of the study was to examine emotions that people feel after receiving feedback and the bodily reactions that accompany these emotions. The Penn State IRB approved the waiver of informed consent (see Appendix A). Participants were also informed that they would receive more details about the study after the experiment concluded.

To avoid violating any ethical principles, the feedback was designed based on past studies that have used discriminatory feedback (i.e., Perez & Soto, 2013). The feedback (“Hi, my name is Michael, I am the lead judge. Overall, we determined that your performance was worse than your peers’. But I wouldn’t feel bad about it, because I heard that you people typically do not do well on this type of task.”) included a non-discriminatory qualification (i.e., “I would not feel bad about it”) to buffer the negative effect of the entire discriminatory statement. Additionally, the informed consent form stated—and the point was reiterated before the experimental portion of the study—that participants could withdraw at any time without penalty.
Moreover, the post-experiment portion of the study included a debriefing session during which participants learned that the actual purpose of the study was to examine how trait anxiety influences the effects of racial discrimination coping strategies (see Appendix B for the debriefing script). The researcher and research assistants were available to answer any questions from the participants regarding the study. Participants were also provided with a list of resources (e.g., contact information for Counseling and Psychology Services on campus) in case they subsequently needed professional help.

Procedure

After giving their consent, participants were scheduled to visit the lab to complete the experimental portion of the study; at this point, they were also randomly assigned to one of the two coping conditions. When participants arrived in the lab, the research assistant briefly explained both the experiment process and informed consent. Participants were then given time to carefully read the consent form and ask questions. They also received copies of the informed consent form. After obtaining the participants’ verbal agreement, the research assistant fitted them with the physiology sensors.

At the outset of the experiment, participants sat quietly for three minutes approximately 4 feet away from a 17” computer monitor, looking at a fixation point (i.e., a small cross) on the screen; this step was designed to obtain their physiological baselines. The fixation point then disappeared, and the participants were asked to report their current emotional states. Next, the participants were told to discuss their personal strengths and weaknesses for three minutes and were informed that three Penn State Psychology students who were watching them on a camera would evaluate their presentations on the basis of persuasiveness, content, and overall effectiveness. The camera in the room recorded their performances for subsequent behavioral
coding. The computer also informed the participants that they would receive feedback after delivering their speeches and have an opportunity to respond to the feedback they received. The participants were then shown a photograph of a White male (see Figure 1) who would serve as the lead judge of their presentations and later provide feedback. The photograph of the White male was used because, as Inman and Baron (1996) noted, White males are viewed as the prototypical perpetrators of racial discrimination.

**Figure 1. The Picture of the “Lead Judge” (i.e., the Confederate)**

![Lead Judge](image)

After displaying the explanation of the speech task, the computer screen gave participants the following instruction: “Please briefly introduce yourself and talk about your strengths and weaknesses.” It then prompted them to begin and started counting down from 3 minutes, enabling participants to keep track of the time remaining for their speeches. Upon completing the speeches, the participants were asked to report their current emotional states (i.e., state affect

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1The photograph of the lead judge was chosen based on the results of a pilot study using a focus group design. The group of six graduate/undergraduate students was given four photographs of different White men downloaded from an open source website and was asked to choose the one that they thought most likely represented a college-aged student with obvious racial biases. Of the four photographs, Figure 1 was chosen by the highest percentage of raters (50%).
ratings). The participants were then asked to sit quietly for 3 minutes while they waited for the judges’ feedback; this step was designed to obtain their pre-feedback baselines.

Before receiving feedback, the participants were asked if they were ready to receive it. Once they indicated they were, the following audio recording of the discriminatory feedback was played: “Hi, my name is Michael, I am the lead judge. Overall, we determined that your performance was worse than your peers. But I wouldn’t feel bad about it, because I heard that you people typically do not do well on this type of task.” The photograph of the lead judge was also shown to the participants to increase the believability of the feedback.

After receiving the feedback, the participants were asked to sit quietly for 2 minutes to process it; this step was designed to obtain their post-feedback response and to measure the direct effects of the discriminatory feedback. Before implementing coping strategies, the participants reported their perceptions of the feedback (i.e., feedback evaluation) and their emotional states. Depending on their assigned coping strategies, they were then asked to spend 3 minutes either writing letters to the judges regarding the discriminatory feedback (confrontation) or writing letters to justify the discriminatory feedback (passive acceptance).

Upon completing the writing task, the participants reported their emotional states and were then asked to spend 3 more minutes sitting quietly and relaxing (recovery period). Participants again reported their emotional states after completing the recovery period and were informed that a full debriefing would follow. The research assistant then fully debriefed the participants, answered any questions they had, and asked them to use the provided laptop to complete a series of questionnaires designed to gather information about their demographics, trait anxiety, and racial discrimination coping strategies. Finally, after completing the surveys,
the participants were thanked and compensated for their time. Figure 2 depicts the study procedure.
Figure 2. Full study procedure

Consent → Physiology sensor attached → Rate State Affect → Physiology Baseline (3 mins) → Rate State Affect → Intro to Speech and Preparation for Feedback → Rate State Affect → Speech Task (3 mins) → Rate State Affect

Pre-feedback Baseline (3 mins) → Introduction to Feedback (Are you ready for the feedback? Yes or No) → Feedback (verbal) → Post-feedback Baseline (2 mins) (process the feedback) → Rate State Affect (1 min) → Intro to Coping Strategies → Confronting (3 mins)

→ Passive acceptance (3 mins)

Rate State Affect → Recovery period (3 mins) → Rate State Affect & Evaluate Feedback → Debrief → Demographic Questionnaire, STAI-T, & Measures of Coping Strategies → Debrief

Note. The green rectangles represent the periods when physiological baselines were obtained; light blue rectangles represent periods when self-reported affect was obtained.
Data Analysis

Physio Data Analysis. Physiological responses were analyzed using MindWare’s HRV software packages (HRV and IMP), of which output was entered to Statistical Package for the Social Science (SPSS), along with other variables.

Data Analytic Plan. I began by identifying outliers from each of the self-reported affect variables (anger, annoyance, anxiety, and stress), physiological arousal measurements (PEP and RSA), and self-reported trait anxiety and coping strategies. Due to the sample size, this process consisted of identifying values that were 3 standard deviations above or below the mean of each measurement at each time point. After Winsorizing outliers, I checked if there were any missing data. For each missing data point, I inserted the mean value in the place of missing value. In terms of manipulation checks of the discrimination scenario, I used paired t-tests to look at the change in self-reported affect and physiological arousal resulting from the discriminatory feedback. Next, to confirm successful randomization, one-way ANOVAs were used to compare self-reported affect (anger, annoyance, anxiety, and stress) and physiological arousal (PEP and RSA) at baseline as well as self-reported trait anxiety in both confronting and passive acceptance conditions.

Hypothesis 1 predicted the effect of trait anxiety in physiological and emotional responses to the racially discriminatory feedback. Considering prior research has shown that the impact of racial discrimination can vary significantly by gender (Coley, Mendes de Leon, Ward, Barnes, Skarupski, & Jacobs, 2017) and race (Shariff-Marlo, Klassen, & Bowie, 2010), analyses were run first with trait anxiety as the sole predictor and then again controlling for race and gender. Race was included in the models by creating three dummy-coded variables using the largest subgroup, Asian/Asian American, as a reference group, resulting in the following
variables: Black/African American (vs Asian/Asian American), Latino/Latino American (vs Asian/Asian American), and Multiethnic (vs Asian/Asian American). Dependent variables were created by subtracting pre-feedback values of PEP, RSA, and self-reported affect (anger, annoyance, anxiety, and stress) from post-feedback values.

Hypothesis 2 predicted the moderating effect of trait anxiety on the effectiveness of coping conditions. Considering prior research has reported that the effectiveness of coping strategies varies can also differ by gender and racial groups (Liang, Alvarez, Juang, & Liang, 2007; Noh et al., 1999), hierarchical regressions were conducted first with only trait anxiety, coping condition, and the trait anxiety × coping condition interaction term and then again with race and gender as covariates. Dependent variables reflecting changes from post-feedback to recovery period (i.e., ∆RSA, ∆PEP, ∆anger, ∆annoyance, ∆anxiety, and ∆stress) were created by subtracting post-feedback (pre-coping) values from recovery period (post-coping) values on these variables.

**Change score interpretation.** When analyzing each hypothesis, change scores of physiological activity and self-reported affect were used as dependent variables to control for individual differences in baseline levels of affect and arousal. Because all the change scores were calculated by subtracting values at the earlier timepoints from those at later timepoints (pre- to post- feedback for Hypothesis 1 and post-feedback to recovery period for Hypothesis 2), positive change scores indicated increases in these values from pre to post, while negative change scores indicated decreases in values from pre to post. Importantly, decreases in PEP correspond to increased sympathetic activity. Thus, across our regression models with a changes score as the dependent variables, negative beta coefficients indicate that as a predictor variable increases in value, the value of the change score decreases (i.e., moves from positive to negative values). This
decrease in change score could represent either lesser increases (positive change score) or greater decreases (negative change score) in RSA, PEP, or self-reported affect from pre to post.

Conversely, positive beta coefficients indicated that as a predictor variable increases in value, the value of the change score also increases, either indicating greater increases (positive change scores) or lesser decreases (negative change score) in RSA, PEP, or self-reported affect (Figure 3).

*Figure 3. Change Score Interpretation*
Chapter 4

Results

Manipulation

Among the 75 participants (final sample) who perceived the feedback to be at least somewhat racially biased, 50.7% considered the feedback to be “extremely” racially biased; 17.3% identified the feedback as “very” racially biased, and 28% believed the feedback to be “moderately” racially biased. The mean bias rating ($M = .87; SD = 1.00$) corresponded to perceptions of the feedback as being “very” racially biased. A regression analysis revealed that participant race and gender did not significantly predict ratings of how racially biased they rated the feedback, $F(4, 70) = 1.85; p = .13$.

To test the effect of the racially discriminatory feedback, a series of paired-sample t-tests were conducted to compare the means of physiological activity (i.e., PEP, RSA) and self-reported affect (i.e., anger, annoyance, anxiety, and stress) before and after the feedback was given. PEP significantly decreased from the pre-feedback baseline to the post-feedback baseline (i.e., indicating increased SNS activity); whereas there were no significant changes in RSA. In terms of self-reported affect, both self-reported anger and annoyance significantly increased, whereas self-reported stress and anxiety significantly decreased after the feedback was given. Therefore, the feedback was racially biased enough to evoke physiological arousal and subjective emotional experience in participants (see Table 2).

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2. Two of the 75 participants (2.6%) rated the feedback to be “somewhat” racially biased but later during the debriefing phase stated that they thought it indeed was racially discriminatory and that they would have given a higher rating if they were aware that the biased component, “you people”, was designed to only refer to race. One participant (1.3%) did not rate the feedback as racially biased, who then later reported in debriefing process that he heard the phrase “you people” and thought it was racially biased, but doubted whether he actually heard the phrase when rating the feedback. Because these three participants actually considered the feedback racially biased, they were ultimately included in the data analysis.
Table 1.

Means (Standard Deviations) of Physiological Activity and Self-Reported Affect at Pre- and Post-Feedback

<table>
<thead>
<tr>
<th>Variables</th>
<th>M (SD)_{pre}</th>
<th>M (SD)_{post}</th>
<th>95% CI</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>RSA</td>
<td>6.55 (1.43)</td>
<td>6.62 (1.34)</td>
<td>-.06, .21</td>
<td>1.15</td>
<td>.26</td>
</tr>
<tr>
<td>PEP</td>
<td>112.63 (10.69)</td>
<td>112.04 (11.20)</td>
<td>-1.11, -.06</td>
<td>-2.40</td>
<td>.03*</td>
</tr>
<tr>
<td>Anger</td>
<td>.28 (.73)</td>
<td>1.29 (1.72)</td>
<td>.62, 1.41</td>
<td>5.10</td>
<td>.00*</td>
</tr>
<tr>
<td>Annoyance</td>
<td>1.27 (1.83)</td>
<td>2.08 (1.83)</td>
<td>.36, 1.27</td>
<td>3.56</td>
<td>.00*</td>
</tr>
<tr>
<td>Anxiety</td>
<td>3.05 (2.49)</td>
<td>2.05 (2.05)</td>
<td>-1.42, -.58</td>
<td>-4.75</td>
<td>.00*</td>
</tr>
<tr>
<td>Stress</td>
<td>3.08 (2.50)</td>
<td>2.05 (2.21)</td>
<td>-1.44, -.61</td>
<td>-4.92</td>
<td>.00*</td>
</tr>
</tbody>
</table>

Note. RSA = Respiratory sinus arrhythmia, PEP = Pre-ejection period. Change scores = post-feedback – pre-feedback. *p < .05

Randomization

Table 3 provides descriptive statistics showing no significant differences between conditions in baselines measure of self-reported affect (i.e., anger, annoyance, anxiety, and stress), physiological activity (i.e., RSA and PEP), or trait as tested by one-way ANOVAs. These findings confirm adequate randomization to experimental conditions.

Table 2.

Mean (Standard Deviation) Values on Variables by Condition at the First Baseline

<table>
<thead>
<tr>
<th>Variables</th>
<th>Confronting</th>
<th>Passive Acceptance</th>
<th>F (1, 74)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trait Anxiety</td>
<td>46.13 (9.65)</td>
<td>46.41 (10.41)</td>
<td>.01</td>
<td>.91</td>
</tr>
<tr>
<td>RSA</td>
<td>6.92 (1.43)</td>
<td>6.56 (2.24)</td>
<td>.71</td>
<td>.40</td>
</tr>
<tr>
<td>PEP</td>
<td>115.98 (10.48)</td>
<td>112.11 (10.91)</td>
<td>2.45</td>
<td>.12</td>
</tr>
<tr>
<td>Anger</td>
<td>.32 (1.07)</td>
<td>.76 (1.69)</td>
<td>1.84</td>
<td>.18</td>
</tr>
<tr>
<td>Annoyance</td>
<td>.97 (1.72)</td>
<td>.95 (1.78)</td>
<td>.01</td>
<td>.95</td>
</tr>
<tr>
<td>Anxiety</td>
<td>2.50 (2.02)</td>
<td>2.78 (2.15)</td>
<td>.35</td>
<td>.56</td>
</tr>
<tr>
<td>Stress</td>
<td>3.47 (2.63)</td>
<td>2.84 (2.29)</td>
<td>1.25</td>
<td>.27</td>
</tr>
</tbody>
</table>

Note. RSA = Respiratory sinus arrhythmia, PEP = Pre-ejection period.
Correlations Between Main Variables

Correlations between the study’s primary variables (i.e., pre- to post-feedback, and post-feedback to recovery period) are presented in Tables 4a and 4b. From pre- to post-feedback, only three significant correlations emerged: changes in self-reported stress were significantly negatively associated with changes in RSA ($p < .05$) and significantly positively associated with changes in self-reported anxiety ($p < .01$). Additionally, changes in self-reported annoyance were significantly positively associated with changes in self-reported anger ($p < .01$). From post-feedback to recovery period (i.e., after employing the assigned coping strategy), four significant correlations emerged: changes in self-reported anger were significantly positively associated with changes in self-reported annoyance ($p < .01$), anxiety ($p < .05$), and stress ($p < .05$). Changes in self-reported anxiety were also significantly positively associated with changes in self-reported stress ($p < .01$).
Table 4 a

Correlations Between Self-Reported Trait Anxiety and Dependent Variables from Pre- to Post-Feedback

<table>
<thead>
<tr>
<th>Trait Anxiety</th>
<th>∆RSA</th>
<th>∆PEP</th>
<th>∆anger</th>
<th>∆annoyance</th>
<th>∆anxiety</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trait Anxiety</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>∆RSA</td>
<td>-.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>∆PEP</td>
<td>.11</td>
<td>-.12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>∆anger</td>
<td>-.09</td>
<td>-.05</td>
<td>.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>∆annoyance</td>
<td>-.15</td>
<td>-.10</td>
<td>.13</td>
<td>.56**</td>
<td></td>
</tr>
<tr>
<td>∆anxiety</td>
<td>-.20</td>
<td>-.28*</td>
<td>-.08</td>
<td>.04</td>
<td>.10</td>
</tr>
<tr>
<td>∆stress</td>
<td>-.17</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. RSA = Respiratory sinus arrhythmia, PEP = Pre-ejection period. ∆ (name of the variable) = changes in the variable from pre- to post-feedback. *p < .05, **p < .01.

Table 4 b

Correlations Between Self-Reported Trait Anxiety and Dependent Variables from Post-Feedback to Recovery Period

<table>
<thead>
<tr>
<th>Trait Anxiety</th>
<th>∆RSA</th>
<th>∆PEP</th>
<th>∆anger</th>
<th>∆annoyance</th>
<th>∆anxiety</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trait Anxiety</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>∆RSA</td>
<td>.04</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>∆PEP</td>
<td>-.13</td>
<td>-.10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>∆anger</td>
<td>.18</td>
<td>-.03</td>
<td>.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>∆annoyance</td>
<td>.05</td>
<td>-.07</td>
<td>.13</td>
<td>.52**</td>
<td></td>
</tr>
<tr>
<td>∆anxiety</td>
<td>.11</td>
<td>-.04</td>
<td>-.16</td>
<td>.25*</td>
<td>.20</td>
</tr>
<tr>
<td>∆stress</td>
<td>.16</td>
<td>-.04</td>
<td>.01</td>
<td>.25*</td>
<td>.20</td>
</tr>
</tbody>
</table>

Note. Total TA = total anxiety scores, RSA = Respiratory sinus arrhythmia, PEP = Pre-ejection period. ∆ (name of the variable) = changes in the variable from post-feedback to recovery period. *p < .05, **p < .01.

Hypothesis 1

To test Hypothesis 1, hierarchical regressions were conducted first with trait anxiety as the lone predictor (model 1), and then again while controlling for race and gender (model 2). The results (Table 5) demonstrate that trait anxiety failed to significantly predict changes in RSA, PEP, self-reported anger, annoyance or stress across any of the models. However, for the change in PEP, results of model 2 revealed that gender was associated with changes in PEP, $B = -1.22$,
\[ t(69) = -2.14, \ p = .04, \] although the overall model was only marginally significant, \[ R^2 = .13, \ F(5, 69) = 2.09, \ p = .08. \] Post-hoc analysis using ANOVA revealed that men tended to have higher change scores in PEP than women. The mean change scores showed that after the feedback, on average, PEP tended to increase (i.e., decreased SNS activity) for men \( (M = .61, \ SE = .45) \), but tended to decrease (i.e., increased SNS activity) for women \( (M = -.86, \ SE = .26) \). This suggests that the feedback might be more influential for female than male participants in terms of stimulating physiological activity.

Results of the hierarchical regression with changes in self-reported anxiety revealed that trait anxiety was also a marginally significant predictor of change scores in anxiety, \[ B = -.04, \ t(73) = -1.75, \ p = .09, \] when not controlling for race and gender. As trait anxiety increased the change scores in self-reported anxiety became less positive. These findings indicate that as trait anxiety increased there tended to be an attenuation in self-reported anxiety, either by resulting in lesser increases or greater decreases in self-reported anxiety from pre- to post- feedback. This effect became non-significant in model 2, once race and gender were controlled, \[ B = -.03, \ t(69) = -1.51, \ p = .14. \] To further understand the effect of trait anxiety on self-reported anxiety both before and after the feedback, correlations were calculated with trait anxiety being the sole predictor. The result of the correlation analysis with the values of self-reported anxiety during pre-feedback baseline showed that increasing trait anxiety significantly predicted self-reported anxiety before the feedback was given, \( r = .49, \ p < .001. \) Similarly, the result of the correlation analysis with the values of self-reported anxiety during post-feedback baseline showed that increasing trait anxiety significantly predicted self-reported anxiety after the feedback was given, \( r = .42, \ p < .001. \) These results suggest that individuals with increasing trait anxiety were more anxious than those with lower trait anxiety both before and after the feedback was given.
Table 3.

*Summary of hierarchical regressions of trait anxiety, race, and gender on changes in physiological activity and self-reported affect from pre- to post-feedback*

<table>
<thead>
<tr>
<th>Model 1</th>
<th>(\Delta\text{RSA})</th>
<th>(\Delta\text{PEP})</th>
<th>(\Delta\text{Anger})</th>
<th>(\Delta\text{Annoyance})</th>
<th>(\Delta\text{Anxiety})</th>
<th>(\Delta\text{Stress})</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(B(SE))</td>
<td>(R^2)</td>
<td>(B(SE))</td>
<td>(R^2)</td>
<td>(B(SE))</td>
<td>(R^2)</td>
</tr>
<tr>
<td>Trait Anxiety</td>
<td>.00 (.01)</td>
<td>.00</td>
<td>.02 (.02)</td>
<td>.01</td>
<td>-.02 (.02)</td>
<td>.02</td>
</tr>
<tr>
<td>Model 2</td>
<td>.01</td>
<td>.13†</td>
<td>.02</td>
<td>.08</td>
<td>.06</td>
<td>.05</td>
</tr>
<tr>
<td>Race</td>
<td>(B(SE))</td>
<td>(R^2)</td>
<td>(B(SE))</td>
<td>(R^2)</td>
<td>(B(SE))</td>
<td>(R^2)</td>
</tr>
<tr>
<td>Black</td>
<td>-.02 (.18)</td>
<td>-.73 (.59)</td>
<td>-.02 (.53)</td>
<td>-.16 (.59)</td>
<td>.19 (.55)</td>
<td>.21 (.55)</td>
</tr>
<tr>
<td>Latino</td>
<td>.11 (.18)</td>
<td>-.73 (.59)</td>
<td>-.07 (.54)</td>
<td>.30 (.60)</td>
<td>-.15 (.56)</td>
<td>.18 (.56)</td>
</tr>
<tr>
<td>Multiethnic</td>
<td>.04 (.26)</td>
<td>-.30 (.88)</td>
<td>-.04 (.80)</td>
<td>.26 (.89)</td>
<td>.30 (.83)</td>
<td>.09 (.82)</td>
</tr>
<tr>
<td>Gender</td>
<td>-.04 (.17)</td>
<td>-1.22* (.57)</td>
<td>.42 (.52)</td>
<td>1.09† (.58)</td>
<td>.34 (.54)</td>
<td>.48 (.53)</td>
</tr>
<tr>
<td>Trait Anxiety</td>
<td>.00 (.01)</td>
<td>.01 (.02)</td>
<td>-.01 (.02)</td>
<td>-.02 (.02)</td>
<td>-.03 (.02)</td>
<td>-.03 (.02)</td>
</tr>
</tbody>
</table>

*Note.* RSA = Respiratory sinus arrhythmia, PEP=Pre-ejection period, \(\Delta\) = change in the variable from pre- to post- feedback. Black = Black/African American (vs. Asian/Asian American), Latino = Latino/Latino American (vs. Asian/Asian American), Multiethnic = Multiethnic (vs. Asian/Asian American). *\(p < .05\), †\(p < .10\).
**General Coping Effects**

A series of regressions were conducted to examine the direct effects (without considering trait anxiety) of coping condition (confronting vs. passive acceptance) on changes in physiological activity and self-reported affect from post-feedback to recovery (post-coping period). The results showed that coping condition did not significantly predict changes in physiological activity or self-reported affect (Table 6a)\(^3\).

However, the results of paired-sample t tests comparing means of physiological activity between post-feedback and recovery period showed that, after coping, RSA marginally decreased (i.e., decreased PNS activity), \(t(74) = -1.87, p = .07\), while PEP significantly increased (i.e., decreased SNS activity), \(t(74) = 5.64, p < .01\). Additionally, all self-reported affect (i.e., anger, annoyance, anxiety, and stress) significantly decreased (all \(p\)'s < .02). The significant changes in PEP and all self-reported affect indicated that coping itself was effective in terms of reducing negative affect and regulating physiological arousal (Table 6b), although there were no differences between coping conditions.

\(^3\) MANOVAs were also used to examine the effects of coping condition on changes in physiological activity and self-reported affect. The results showed that there was no significant difference between confronting and passive acceptance conditions on changes in physiological activity, \(F (2, 72) = .02, p = .98, \eta^2_p = .001\), or on self-reported affect \(F (4, 70) = .63, p = .65, \eta^2_p = .04\) from post-feedback to recovery period.
Table 4a.

*Summary of linear regressions of coping condition on changes in physiological activity and self-reported affect from post-feedback to recovery (post-coping)*

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>B</th>
<th>SE(B)</th>
<th>β</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>∆RSA</td>
<td>.03</td>
<td>.12</td>
<td>.02</td>
<td>.21</td>
<td>.84</td>
</tr>
<tr>
<td>∆PEP</td>
<td>.02</td>
<td>.61</td>
<td>.00</td>
<td>.04</td>
<td>.97</td>
</tr>
<tr>
<td>∆Anger</td>
<td>-.07</td>
<td>.28</td>
<td>-.03</td>
<td>-.24</td>
<td>.81</td>
</tr>
<tr>
<td>∆Annoyance</td>
<td>.41</td>
<td>.38</td>
<td>.12</td>
<td>1.07</td>
<td>.29</td>
</tr>
<tr>
<td>∆Anxiety</td>
<td>-.01</td>
<td>.25</td>
<td>-.01</td>
<td>-.05</td>
<td>.96</td>
</tr>
<tr>
<td>∆Stress</td>
<td>-.22</td>
<td>.26</td>
<td>-.10</td>
<td>-.85</td>
<td>.40</td>
</tr>
</tbody>
</table>

*Note. RSA = Respiratory sinus arrhythmia, PEP=Pre-ejection period. ∆ (variable) = change scores of the variable. ∆(physiological variable) = Recovery period – post-feedback, ∆(self-reported variable) = Post-coping – post-feedback.*

Table 6b.

*Means (standard deviations) of physiological activity and self-reported affect at post-feedback and recovery period/post-coping*

<table>
<thead>
<tr>
<th>Variables</th>
<th>M (SD)post-feedback</th>
<th>M (SD)recovery (post-coping)</th>
<th>95% CI</th>
<th>t(74)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>RSA</td>
<td>6.62 (1.34)</td>
<td>6.49 (1.38)</td>
<td>-.28, .01</td>
<td>-1.87</td>
<td>.07†</td>
</tr>
<tr>
<td>PEP</td>
<td>112.04 (11.20)</td>
<td>113.09 (11.01)</td>
<td>1.20, 2.52</td>
<td>5.64</td>
<td>.00**</td>
</tr>
<tr>
<td>Anger</td>
<td>1.29 (1.72)</td>
<td>.84 (1.61)</td>
<td>-.73, -.18</td>
<td>-3.30</td>
<td>.00**</td>
</tr>
<tr>
<td>Annoyance</td>
<td>2.08 (2.17)</td>
<td>1.39 (1.85)</td>
<td>-1.08, -.31</td>
<td>-3.62</td>
<td>.00**</td>
</tr>
<tr>
<td>Anxiety</td>
<td>2.05 (2.05)</td>
<td>1.57 (1.96)</td>
<td>-.73, -.23</td>
<td>-3.89</td>
<td>.00**</td>
</tr>
<tr>
<td>Stress</td>
<td>2.05 (2.20)</td>
<td>1.73 (2.16)</td>
<td>-.58, -.06</td>
<td>-2.46</td>
<td>.02**</td>
</tr>
</tbody>
</table>

*Note. RSA = Respiratory sinus arrhythmia, PEP=Pre-ejection period. *p < .05, **p < .01, † p < .10. For each physiological variable, means were compared between post-feedback and recovery period. For each self-reported affective variable, means were compared between post-feedback and post-coping. Change scores = recovery period (post-coping) – post-feedback.*
**Hypothesis 2**

To test Hypothesis 2, hierarchical regressions were conducted first with trait anxiety, coping condition, and the interaction between trait anxiety and coping condition as the predictors, and then again while controlling for race and gender. The results (Table 7) demonstrate that trait anxiety, coping condition, and the interaction between trait anxiety and coping condition failed to significantly predict changes in RSA, PEP, and self-reported annoyance, anxiety, and stress. However, for changes in self-reported anger, the results showed that trait anxiety significantly predicted changes in self-reported anger, $B = .05$, $t(71) = 2.19$, $p = .03$, although this model was only marginally significant, $R^2 = .09$, $F(3, 71) = 2.26$, $p = .09$.

The significant main effect of trait anxiety indicated that as trait anxiety increased the change in self-reported anger from post-feedback to recovery period became more positive, suggesting that trait anxiety enhanced anger by resulting in either lesser decreases or greater increases in anger. However, when controlling for race and gender, trait anxiety was no longer predictive, $B = .06$, $t(67) = 2.36$, $p = .02$, as the model became non-significant, $R^2 = .11$, $F(7, 67) = 1.19$, $p = .32$. 
Table 5.

Summary of hierarchical regressions of trait anxiety, coping condition, gender, race, and trait anxiety by coping condition on changes in physiological activity and self-reported affect from post-feedback to recovery period

<table>
<thead>
<tr>
<th></th>
<th>ΔRSA</th>
<th></th>
<th>ΔPEP</th>
<th></th>
<th>ΔAnger</th>
<th></th>
<th>ΔAnnoyance</th>
<th></th>
<th>ΔAnxiety</th>
<th></th>
<th>ΔStress</th>
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</thead>
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<td>B(SE)</td>
<td>R²</td>
<td>B(SE)</td>
<td>R²</td>
<td>B(SE)</td>
<td>R²</td>
<td>B(SE)</td>
<td>R²</td>
<td>B(SE)</td>
<td>R²</td>
<td>B(SE)</td>
<td>R²</td>
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<td>Model 1</td>
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<td>.02</td>
<td>.09†</td>
<td>.03</td>
<td>.02</td>
<td>.03</td>
<td>.03</td>
<td>.03</td>
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<td></td>
</tr>
<tr>
<td>Coping Condition</td>
<td>.03 (.12)</td>
<td>.03 (.61)</td>
<td>.45 (.32)</td>
<td>.46 (.51)</td>
<td>.11 (.32)</td>
<td>.03 (.32)</td>
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<td></td>
</tr>
<tr>
<td>Trait Anxiety</td>
<td>-.01 (.01)</td>
<td>-.05 (.05)</td>
<td>.05* (.02)</td>
<td>.04 (.04)</td>
<td>.03 (.02)</td>
<td>.02 (.02)</td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>TA * Coping Condition</td>
<td>.02 (.01)</td>
<td>.03 (.06)</td>
<td>-.05 (.03)</td>
<td>-.05 (.05)</td>
<td>-.02 (.03)</td>
<td>.01 (.03)</td>
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<td>Model 2</td>
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<td>.09</td>
<td>.11</td>
<td>.07</td>
<td>.04</td>
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<td>Race</td>
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<td></td>
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<td></td>
<td></td>
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<tr>
<td>Black</td>
<td>-.10 (.17)</td>
<td>1.87* (.82)</td>
<td>.31 (.45)</td>
<td>.94 (.70)</td>
<td>.14 (.44)</td>
<td>.06 (.43)</td>
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<tr>
<td>Latino</td>
<td>.14 (.17)</td>
<td>1.12 (.83)</td>
<td>.51 (.45)</td>
<td>.25 (.70)</td>
<td>.48 (.44)</td>
<td>.64 (.43)</td>
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<tr>
<td>Multiethnic</td>
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<td>1.14 (1.29)</td>
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<td>-.17 (1.09)</td>
<td>.27 (.69)</td>
<td>.26 (.67)</td>
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<td>Gender</td>
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<td>-.70 (.77)</td>
<td>.15 (.42)</td>
<td>-.95 (.65)</td>
<td>.03 (.41)</td>
<td>.40 (.40)</td>
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<tr>
<td>Coping Condition</td>
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<td>.48 (.67)</td>
<td>.60 (.36)</td>
<td>.53 (.56)</td>
<td>.19 (.36)</td>
<td>.12 (.35)</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Trait Anxiety</td>
<td>-.01 (.01)</td>
<td>-.04 (.05)</td>
<td>.06* (.03)</td>
<td>.04 (.04)</td>
<td>.03 (.02)</td>
<td>.03 (.02)</td>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>TA * Coping Condition</td>
<td>.01 (.01)</td>
<td>.02 (.06)</td>
<td>-.06† (.03)</td>
<td>-.05 (.05)</td>
<td>-.03 (.03)</td>
<td>.00 (.03)</td>
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</tbody>
</table>

Note. RSA = Respiratory sinus arrhythmia, PEP=Pre-ejection period, TA = Trait Anxiety, TA * Coping Condition = the interaction term between trait anxiety and coping condition, Δ (name of the variable) = changes in the variable from post-feedback to recovery period. Black = Black/African American (vs. Asian/Asian American), Latino = Latino/Latino American (vs. Asian/Asian American), Multiethnic = Multiethnic (vs. Asian/Asian American). *p < .05, †p < .10.
Post-Hoc Analyses

The effects of the speech study. Although both self-reported anger and annoyance significantly increased from pre-to-post feedback, both self-reported anxiety and stress surprisingly decreased, which is in contrast to prior research showing that experiencing racial discrimination is associated with increased negative affect (Sellers, Caldwell, Schmeelk-Cone, & Zimmerman, 2003). Considering the racially discriminatory feedback was introduced after the speech task, a stressor, it is possible that the decreases in self-reported anxiety and stress resulted from the speech task. Paired sample t tests were calculated to compare the means of self-reported affect as well as physiological measures (i.e., RSA and PEP) before and after the speech task. The results (Table 8) showed that while RSA and self-reported annoyance did not change significantly from pre-to-post speech (both p’s > .16), PEP, self-reported anger, anxiety, and stress were all significantly decreased (all p’s < .001).

Table 6.

Means (Standard Deviations) of Physiological Activity and Self-Reported Affect at Pre- and Post-Speech Baselines

<table>
<thead>
<tr>
<th>Variables</th>
<th>$M \ (SD)_{pre-speech}$</th>
<th>$M \ (SD)_{post-speech}$</th>
<th>95% CI</th>
<th>t(74)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>RSA</td>
<td>6.74 (1.87)</td>
<td>6.55 (1.43)</td>
<td>-.47, .08</td>
<td>-1.42</td>
<td>.16</td>
</tr>
<tr>
<td>PEP</td>
<td>114.07 (10.80)</td>
<td>112.63 (10.69)</td>
<td>-2.25, -.63</td>
<td>-3.54</td>
<td>.00**</td>
</tr>
<tr>
<td>Anger</td>
<td>.60 (1.52)</td>
<td>.28 (.73)</td>
<td>-.59, -.05</td>
<td>-2.36</td>
<td>.02**</td>
</tr>
<tr>
<td>Annoyance</td>
<td>1.40 (2.18)</td>
<td>1.27 (1.83)</td>
<td>-.52, .25</td>
<td>-.69</td>
<td>.49</td>
</tr>
<tr>
<td>Anxiety</td>
<td>3.99 (2.51)</td>
<td>3.05 (2.49)</td>
<td>-1.43, -.44</td>
<td>-3.75</td>
<td>.00**</td>
</tr>
<tr>
<td>Stress</td>
<td>3.91 (2.43)</td>
<td>3.08 (2.50)</td>
<td>-1.25, .41</td>
<td>-3.94</td>
<td>.00**</td>
</tr>
</tbody>
</table>

Note. RSA = Respiratory sinus arrhythmia, PEP = Pre-ejection period. Change scores = Pre-Speech – Post-Speech. *p < .05, **p < .01.
The effects of coping match. Considering that the participants were not necessarily provided with an option to choose their preferred coping responses in situations of discrimination, it is possible that the effectiveness between confronting and passive acceptance or the effect of trait anxiety in this coping situation might depend on the whether the assigned strategy matched the typical coping preference for participants. Therefore, an additional set of analyses was conducted to examine the effects of mismatch/match between preferred coping strategy and assigned coping strategy after coping with the discriminatory feedback. To create a variable to reflect whether the assigned condition matched with preferred condition, I first created a variable reflecting participants’ trait preference of coping strategies for racial discrimination based on their mean scores on the confronting and passive acceptance subscales from the self-report coping measure. Overall, the means on the confronting \( (M = 2.84, SD = 1.00) \) and passive acceptance \( (M = 2.49, SD = 1.10) \) subscales were below 3 (i.e., sometimes like me). The highest mean for each participant was used as an indicator of preference for that strategy.

After determining participants’ trait preference for confronting and passive acceptance, I checked if their actual application of coping strategies (i.e., Actual Condition) matched with their trait preference (i.e., variable: coping match, 0 = matched, 1= mismatched). Individuals who did not prefer confronting or passive acceptance were considered mismatched. In total, 47 participants’ trait preference of coping strategies for racial discrimination matched with their actual application of provided coping strategies; whereas 28 participants mismatched.

To test the effect of coping match, hierarchical regressions were run with trait anxiety, coping condition, coping match, and the corresponding interaction terms, and then again while controlling for race and gender. The results (Table 9) demonstrate that neither coping match, nor
the trait anxiety × coping match interaction, nor the coping condition × coping match interaction significantly predicted changes in RSA, PEP, or self-reported affect across any of the models.
Table 7.
Summary of hierarchical regressions of trait anxiety, coping condition, coping match and their interactions changes in physiological activity and self-reported affect from post-feedback to recovery period

<table>
<thead>
<tr>
<th></th>
<th>ΔRSA</th>
<th>ΔPEP</th>
<th>ΔAnger</th>
<th>ΔAnnoyance</th>
<th>ΔAnxiety</th>
<th>ΔStress</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B(SE)</td>
<td>R²</td>
<td>B(SE)</td>
<td>R²</td>
<td>B(SE)</td>
<td>R²</td>
</tr>
<tr>
<td><strong>Model 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coping Condition</td>
<td>.15 (.16)</td>
<td>.05</td>
<td>.04</td>
<td>.09</td>
<td>.27 (.68)</td>
<td>-.21 (.41)</td>
</tr>
<tr>
<td>Trait Anxiety</td>
<td>-.01 (.01)</td>
<td>- .06 (.06)</td>
<td>.05† (.03)</td>
<td>.03 (.05)</td>
<td>.05 (.03)</td>
<td>.05 (.03)</td>
</tr>
<tr>
<td>Coping Match</td>
<td>.15 (.23)</td>
<td>-.67 (1.14)</td>
<td>.09 (.61)</td>
<td>.54 (.95)</td>
<td>-.22 (.58)</td>
<td>.25 (.56)</td>
</tr>
<tr>
<td>TA * Coping Condition</td>
<td>.02 (.01)</td>
<td>.01 (.07)</td>
<td>-.05 (.04)</td>
<td>-.05 (.06)</td>
<td>-.02 (.04)</td>
<td>.02 (.03)</td>
</tr>
<tr>
<td>Coping Condition *</td>
<td>-.33 (.29)</td>
<td>.43 (1.45)</td>
<td>-.23 (.77)</td>
<td>.15 (1.20)</td>
<td>.67 (.74)</td>
<td>.20 (.72)</td>
</tr>
<tr>
<td>TA * Coping Match</td>
<td>.00 (.01)</td>
<td>.07 (.07)</td>
<td>-.01 (.04)</td>
<td>.00 (.06)</td>
<td>-.05 (.04)</td>
<td>.08* (.03)</td>
</tr>
<tr>
<td><strong>Model 2</strong></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>-.11 (.17)</td>
<td>1.85† (1.84)</td>
<td>.31 (.46)</td>
<td>.95 (.71)</td>
<td>.18 (.44)</td>
<td>.11 (.42)</td>
</tr>
<tr>
<td>Latino</td>
<td>.16 (.17)</td>
<td>1.06 (.84)</td>
<td>.53 (.46)</td>
<td>.25 (.71)</td>
<td>.47 (.44)</td>
<td>.69 (.42)</td>
</tr>
<tr>
<td>Multiethnic</td>
<td>.18 (.27)</td>
<td>1.40 (1.34)</td>
<td>.50 (.73)</td>
<td>-.31 (1.12)</td>
<td>.19 (.70)</td>
<td>.01 (.67)</td>
</tr>
<tr>
<td>Gender</td>
<td>-.08 (.16)</td>
<td>-.65 (.78)</td>
<td>.15 (.43)</td>
<td>-.99 (.66)</td>
<td>.02 (.41)</td>
<td>.36 (.39)</td>
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<tr>
<td>Coping Condition</td>
<td>.18 (.17)</td>
<td>.48 (.85)</td>
<td>.69 (.46)</td>
<td>.31 (.71)</td>
<td>-.12 (.44)</td>
<td>-.10 (.42)</td>
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<tr>
<td>Trait Anxiety</td>
<td>-.01 (.01)</td>
<td>-.05 (.06)</td>
<td>.06† (.03)</td>
<td>.02 (.05)</td>
<td>.05† (.03)</td>
<td>.05 (.03)</td>
</tr>
<tr>
<td>Coping Match</td>
<td>.16 (.24)</td>
<td>-.74 (1.16)</td>
<td>.08 (.63)</td>
<td>.68 (.98)</td>
<td>-.17 (.61)</td>
<td>.35 (.58)</td>
</tr>
<tr>
<td>TA * Coping Condition</td>
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<td>-.01 (.07)</td>
<td>-.06 (.04)</td>
<td>-.04 (.06)</td>
<td>-.02 (.04)</td>
<td>.02 (.04)</td>
</tr>
<tr>
<td>Coping Condition *</td>
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<td>.55 (1.47)</td>
<td>-.25 (.80)</td>
<td>.07 (1.24)</td>
<td>.59 (.77)</td>
<td>.03 (1.73)</td>
</tr>
<tr>
<td>TA * Coping Match</td>
<td>.00 (.01)</td>
<td>.06 (.07)</td>
<td>-.01 (.04)</td>
<td>-.01 (.06)</td>
<td>-.05 (.04)</td>
<td>.09* (.04)</td>
</tr>
</tbody>
</table>

**Note.** RSA = Respiratory sinus arrhythmia, PEP=Pre-ejection period, TA = Trait Anxiety, TA* Coping Condition = the interaction term between trait anxiety and coping condition, Coping Condition * Coping Match = the interaction term between coping condition and coping match, TA * Coping Match = the interaction term between trait anxiety and coping match, Δ (name of the variable) = changes in the variable from post-feedback to recovery period. Black = Black/African American (vs. Asian/Asian American), Latino = Latino/Latino American (vs. Asian/Asian American), Multiethnic = Multiethnic (vs. Asian/Asian American). * p < .05, † p < .10.
Changes in affect and physiological activation during coping. Considering that the recovery period examined in the primary analyses above began after the three-minute coping task (confronting or passive acceptance), it is possible that the effectiveness of coping might be more prominent during the actual three minutes of coping. Similar to recovery period findings, RSA and self-reported anger, annoyance, anxiety, and stress all significantly decreased from post-feedback to coping period (all \(p \text{'s} < .02\)). While RSA significantly decreased (\(p < .01\)), there were no significant changes in PEP (\(p = .93\), Table 10).

Table 8.

Means (Standard Deviations) of Physiological Activity and Self-Reported Affect at Post-Feedback and Coping Period

<table>
<thead>
<tr>
<th>Variables</th>
<th>(M \ (SD)_{\text{post-feedback}})</th>
<th>(M \ (SD)_{\text{coping period}})</th>
<th>95% CI</th>
<th>(t(74))</th>
<th>(p)</th>
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</thead>
<tbody>
<tr>
<td>RSA</td>
<td>6.62 (1.34)</td>
<td>5.86 (1.60)</td>
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<td>-6.01</td>
<td>.00**</td>
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<tr>
<td>PEP</td>
<td>112.04 (11.20)</td>
<td>112.12 (12.10)</td>
<td>-1.73, 1.89</td>
<td>.09</td>
<td>.93</td>
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<tr>
<td>Anger</td>
<td>1.29 (1.72)</td>
<td>.84 (1.61)</td>
<td>-.73, -.18</td>
<td>-3.30</td>
<td>.00**</td>
</tr>
<tr>
<td>Annoyance</td>
<td>2.08 (2.17)</td>
<td>1.39 (1.85)</td>
<td>-1.08, -.31</td>
<td>-3.62</td>
<td>.00**</td>
</tr>
<tr>
<td>Anxiety</td>
<td>2.05 (2.05)</td>
<td>1.57 (1.96)</td>
<td>-.73, -.23</td>
<td>-3.89</td>
<td>.00**</td>
</tr>
<tr>
<td>Stress</td>
<td>2.05 (2.21)</td>
<td>1.73 (2.16)</td>
<td>-.58, -.06</td>
<td>-2.46</td>
<td>.02**</td>
</tr>
</tbody>
</table>

*Note. RSA = Respiratory sinus arrhythmia, PEP=Pre-ejection period. Change scores = Coping period–post-feedback. \(* p < .05, \ \text{**} p < .01, \ \text{†} p < .10.\)

Thus, I created a new set of physiological activation and self-reported affect change scores variables by subtracting the post-feedback baseline levels from the coping period levels. These were then used as dependent variables in a new set of regression models with trait anxiety, coping condition, and the interaction between trait anxiety and coping condition being predictors, and then again while controlling for race and gender.

The results (Table 11) demonstrated that trait anxiety, coping condition, and the interaction between trait anxiety and coping condition failed to significantly predict changes in
RSA or self-reported affect across any of the models. However, for changes in PEP from post-feedback to coping period, the result revealed that the main effect of trait anxiety was significant, $B = .18$, $t(71) = 2.19$, $p = .03$, and the model was significant, $R^2 = .11$, $F(3, 71) = 2.80$, $p = .046$, when not controlling for race and gender. The significant main effect of trait anxiety suggested that as trait anxiety increased, change in PEP became more positive (i.e., lesser decreases in PEP or greater increases in PEP) during coping period. The significant main effect of trait anxiety was further qualified by a significant effect of the interaction between trait anxiety and coping condition, $B = -.32$, $t(71) = -2.86$, $p = .01$.

The results of a simple slope analysis showed that, for individuals using confronting, trait anxiety positively predicted changes in PEP, $B = .18$, $t(71) = 2.19$, $p = .03$, suggesting that as trait anxiety increased, the PEP change scores for participants using confronting became more positive. This indicates that increasing trait anxiety was associated with either greater increases in PEP during coping period (i.e., greater decreases in SNS activity from before to during coping) or lesser decreases (i.e., lesser increases in SNS activity). For individuals using passive acceptance, the effect of trait anxiety was marginally significant, $B = -.14$, $t(71) = -1.84$, $p = .07$, suggesting that as trait anxiety increased, the change scores of PEP became less positive. This indicates that increasing trait anxiety was associated with either lesser increases in PEP during coping period (i.e., lesser decreases in SNS activity from before to during coping) or greater decreases (i.e., greater increases in SNS activity, Figure 4).
Table 9.

Summary of hierarchical regressions of trait anxiety, coping condition, gender, race, and trait anxiety by coping condition on changes in physiological activity and self-reported affect from post-feedback to coping period

<table>
<thead>
<tr>
<th></th>
<th>∆RSA</th>
<th>∆PEP</th>
<th>∆Anger</th>
<th>∆Annoyance</th>
<th>∆Anxiety</th>
<th>∆Stress</th>
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</thead>
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<td></td>
<td>$B$($SE$)</td>
<td>$R^2$</td>
<td>$B$($SE$)</td>
<td>$R^2$</td>
<td>$B$($SE$)</td>
<td>$R^2$</td>
</tr>
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<td><strong>.11</strong></td>
<td>.03</td>
<td>.04</td>
<td>.01</td>
<td>.03</td>
</tr>
<tr>
<td>Coping Condition</td>
<td>.24 (.22)</td>
<td>-52 (.11)</td>
<td>-.07 (.28)</td>
<td>.41 (.38)</td>
<td>-.01 (.25)</td>
<td>-22 (.26)</td>
</tr>
<tr>
<td>Trait Anxiety</td>
<td>-.01 (.02)</td>
<td><strong>.18</strong></td>
<td>.02 (.02)</td>
<td>.02 (.03)</td>
<td>-.01 (.02)</td>
<td>.00 (.02)</td>
</tr>
<tr>
<td>TA * Coping Condition</td>
<td>.00 (.02)</td>
<td>-.32</td>
<td>-.04 (.03)</td>
<td>-.05 (.04)</td>
<td>.00 (.03)</td>
<td>.02 (.03)</td>
</tr>
</tbody>
</table>

| **Model 2**         | .08   | .16   | .04    | .06        | .08      | .04   |
| Race                |       |       |        |            |          |        |
| Black               | -.16 (.30) | -.46 (1.51) | .01 (.39) | .24 (.53) | .21 (.34) | .02 (.36) |
| Latino              | -.45 (.30) | -1.03 (1.51) | .16 (.39) | -.22 (.53) | **.77** | .33 (.37) |
| Multiethnic         | -.10 (.46) | .46 (2.36) | .28 (.60) | .43 (.83) | .46 (.53) | .18 (.57) |
| Gender              | .12 (.28) | **-2.41** | .17 (.36) | .19 (.49) | .01 (.32) | .13 (.34) |
| Coping Condition    | .19 (.24) | -.68 (1.22) | -.01 (.31) | .52 (.43) | .11 (.27) | -.18 (.30) |
| Trait Anxiety       | -.02 (.02) | **.16** | .03 (.02) | .02 (.03) | .00 (.02) | .00 (.02) |
| TA * Coping Condition | .00 (.02) | -.31 | -.04 (.03) | -.05 (.04) | -.01 (.03) | .02 (.03) |

*Note. RSA = Respiratory sinus arrhythmia, PEP=Pre-ejection period, TA = Trait Anxiety, TA* Coping Condition = the interaction term between trait anxiety and coping condition, ∆ (name of the variable) = changes in the variable from post-feedback to coping period. Black = Black/African American (vs. Asian/Asian American), Latino = Latino/Latino American (vs. Asian/Asian American), Multiethnic = Multiethnic (vs. Asian/Asian American). *$p < .05$, †$p < .10$
Figure 4. The moderating effect of trait anxiety on the effect of coping strategies (i.e., confronting vs. passive acceptance) on changes in PEP from post-feedback to coping period. Low and high trait anxiety represent one SD below and above the mean of the total anxiety score. Negative change scores indicated decreased PEP (i.e., increased SNS activity), while positive change scores indicated increased PEP from post-feedback to coping period.
Chapter 5
Discussion

The present study examined the role of trait anxiety in (1) the responses to an experiment-induced racial discriminatory situation; and (2) the effectiveness of the two coping strategies (i.e., confronting vs. passive acceptance) as indexed via changes in physiological activity (i.e., RSA and PEP) and self-reported affect (i.e., anger, annoyance, anxiety, and stress). In terms of the response to racial discrimination, the findings revealed that participants with increasing trait anxiety actually reported a marginally significant attenuation of self-reported anxiety (lesser increases or more decreases) in from pre- to post-feedback.

In terms of the effectiveness of coping strategies, both coping conditions were equally effective in regulating negative affect and physiological activity after experiencing racial discrimination. However, the effectiveness of coping strategies varied across individuals with different levels of trait anxiety and depending on the time points considered.

The Role of Trait Anxiety in Response to Racial Discrimination

On average, participants’ self-reported anxiety significantly decreased from pre-feedback baseline to after the racially discriminatory feedback was given (i.e., post-feedback baseline). This finding conflicts with past studies that experiencing racial discrimination is associated with increased negative affect (Sellers et al., 2003). However, in the current study the discriminatory feedback was introduced after the completion of the stressful. As a result, the decreased anxiety from pre-feedback baseline might reflect more of a sense of relief from completing the speech task (and receiving any type of feedback) than it does a response to the racially discriminatory feedback. In fact, prior research on socially anxious individuals has shown that the levels of state anxiety tended to decrease after the completion of a speech task and were further decreased after
receiving verbal feedback from confederates regarding their speech performance (Chen, Mak, & Fujita, 2015).

Although self-reported anxiety decreased from pre- to post- feedback, in general, individuals with increasing trait anxiety surprisingly experienced a greater attenuation of anxiety (i.e., either greater decreases or lesser increases in anxiety), relatively to those with lower trait anxiety. This attenuation might possibly reflect two characteristics of trait anxiety. First, this pattern might reflect the tendency of those with higher trait anxiety to perceive more threat (e.g., perceiving the racially discriminatory feedback as a threat) under stressful situations, as well as being more sensitive to negative stimuli (i.e., racial discrimination) than low trait anxious individuals (Bradley et al., 1998; Mathews & MacLeod, 2005; Marzi, Regina, & Righi, 2014). This greater attenuation among those with increasing trait is especially interesting given that higher trait anxiety was associated with greater state ratings of anxiety both before and after the feedback. This is consistent with prior research showing that high trait anxious individuals tended to have more intense psychological reaction to stress than low trait anxious individuals (Villada et al., 2016).

Second, considering that anxiety-prone individuals tend to use worry to maintain a negative emotional state to avoid an unexpected event (Newman & Llera, 2011), the lesser increases in self-reported anxiety among individuals with increasing trait anxiety could have resulted from this population already having high levels of anxiety before the feedback and possible efforts (conscious or unconscious to maintain this high level of anxiety). In essence, this may have created a ceiling effect with respect to the possible change in anxiety among those higher in trait anxiety. Importantly, the effect of trait anxiety was not found in changes in other self-reported affect (i.e., anger, annoyance, and stress), which was counter to Hypothesis 1. It is
possible that the effect of trait anxiety might be more specific and prominent to the domain of anxiety than to other negative emotions in response to a stressor.

**The Role of Trait Anxiety in Coping**

Overall, there were no differences in the effectiveness between confronting or passive acceptance in facilitating physiological and emotional recovery from racial discrimination. Coping of any kind was effective enough in reducing self-reported negative affect and regulating physiological arousal. This is incongruent with prior research showing that either confronting or passive acceptance is more effective than the other (e.g., Forsyth & Carter, 2012; Noh & Kasper, 2003). The equal effectiveness of both strategies might have resulted from the use of a writing task to induce the respective coping strategies. Past research has demonstrated that expressive writing is associated with reduction in physiological arousal and self-reported distress (Baikie & Wilhelm, 2005, Park & Blumberg, 2002, Pennebaker, 1997). It is possible that participants might have benefited from being able to engage in expressive writing about their thoughts and experiences in both coping conditions, even if the exact nature of the writing was different.

Alternatively, the equal effectiveness in passive acceptance and confronting might have resulted from a possible reappraisal interpretation of the passive acceptance condition instructions. Reappraisal refers to the process of reinterpreting the meaning of emotional stimuli and has been associated with decreased negative affect and physiological arousal (Ray, Wilhelm, & Gross, 2008). Under the passive acceptance condition, participants were asked to provide a rationale to justify why they think the feedback was fair. This step might have led to a reappraisal of the feedback as a positive experience, which could have ultimately reduced its impact. In fact, based on the qualitative data of participants’ writing responses, many participants actually “thanked” the judge for giving them “helpful” feedback, as they could use this feedback
to improve their speech performance in the future. Further analyses of these writing responses may produce further insight into how the two coping conditions were interpreted.

Interestingly, the role of trait anxiety in the effect of coping strategies varied between the coping period and post-coping period (i.e., recovery period). When applying confronting, participants with increasing trait anxiety possibly had significantly attenuated SNS activity, compared to those with lower trait anxiety. However, when applying passive acceptance, participants with increasing trait anxiety had marginally, significantly enhanced SNS activity, compared to those with lower trait anxiety. This could indicate that confronting was more effective than passive acceptance for individuals with increasing trait anxiety in regulating their physiological responses to racial discrimination. Past studies have documented that trait anxious individuals tended to use strategies that targeted their emotional experience (e.g., anxiety, stress, fear) rather than the source of the problem to cope with a stressor (Villada et al., 2016). It is possible that when individuals with increasing trait anxiety were not able to choose their desired coping responses (e.g., passive acceptance) and had to confront, they were able to pay less attention to their emotional experience thereby actively responding to the sources of the stress (i.e., the lead judge), which could have resulted in decreased physiological activation.

Alternatively, considering this result was found during coping period, changes in SNS activity could be an indicator of coping effort as opposed to coping efficacy. Considering that individuals with increasing trait anxiety might need more cognitive effort to successfully employ adaptive strategies to down-regulate their affect (Campbell-Sill et al., 2011), the enhanced physiological arousal among participants with increasing trait anxiety using passive acceptance could possibly indicate that these participants applied passive acceptance more easily than confronting. The attenuated physiological arousal among those using confronting, on the other
hand, could mean that individuals with increasing trait anxiety did not know how to confront racial discrimination or were working harder when trying to employ a confronting strategy in the context of responding to discrimination.

As for the role of trait anxiety during recovery (i.e., post-coping) period, the effect of trait anxiety did not vary between confronting and passive acceptance conditions (i.e., Hypothesis 2 was not supported). However, individuals with increasing trait anxiety had significantly lesser decreases/greater increases in self-reported anger than those with lower trait anxiety during recovery period, suggesting that coping might not be as effective for this population as for individuals with lower trait anxiety. Given that greater mental effort might be needed for regulating emotions among high trait anxious individuals (Campbell-Sill et al., 2011), this might interfere with their ability to successfully apply coping strategies. Alternatively, research has noted that high trait anxious individuals, compared to low trait anxious individuals, are more sensitive to negative triggers and have a tendency to perceive negative triggers as more arousing (Marzi, Regina, & Righi, 2014). Because of this, it is possible that, when asked about negative affect words such as anger during the post-feedback and recovery period, high trait anxious individuals might have given a higher rating than low trait anxious individuals. Therefore, the enhanced self-reported anger among individuals with increasing trait anxiety could have resulted from the tendency of reporting more intense negative affect in this population, even though their physiological reactivity from post-feedback to recovery period did not differ from those with lower trait anxiety.

Considering the ineffectiveness of these two coping strategies in facilitating emotional recovery among individuals with increasing trait anxiety, the aforementioned enhanced physiological arousal among individuals with increasing trait anxiety applying passive
acceptance might therefore result from the easier application of passive acceptance (relative to confronting) in this population. However, it should be noted that there was no trait anxiety by coping condition interaction found on changes in physiological activity from post-feedback to recovery period. More research is needed to further examine how trait anxious individuals apply confronting and passive acceptance, as well as the physiological and psychological effectiveness of these two coping strategies.

**The Role of Gender and Race**

In response to racial discrimination. The results revealed that the physiological effect of racially discriminatory feedback varied by gender. Overall, women had marginally, significant decreases in PEP (i.e., increases in SNS activity) while men had marginally, significant increases in PEP (i.e., decreases in SNS activity) after the racially discriminatory feedback was given. This result might indicate that, compared to men, the feedback affected women more in terms of stimulating physiological activity. The double-minority identity among ethnic minority women may contribute greater vulnerability to experiencing more physiological arousal than men when facing racial discrimination. Prior research has revealed that experiencing racial discrimination can result in poorer mental health in women than in men (Coley et al., 2017). During the debriefing phase, female participants often reported that the feedback was both gender and racially biased. The intersectionality between being female and an ethnic minority could make female participants in the current study feel like they were facing double marginalization, which might have led to gender differences in affective responses to racial discrimination. Additionally, the gender of the lead judge (i.e., a White man) might also drive the gender difference in response to racial discrimination. Although several male participants noted the discriminatory component in the feedback (i.e., “you people”) could either refer to gender or race, they often
mentioned believing that the phrase only referred to their racial background, as they shared the same gender identity with the “lead judge”.

In terms of racial differences, the non-significant results in responses to racial discrimination among different racial groups were inconsistent with past research showing that the adverse outcome of racial discrimination varied across different racial/ethnic groups (Paradies et al., 2015; Shariff-Marco, Klassen, & Bowie, 2010). Considering each racial subgroup, except Asian/Asian American (i.e., Black/African American, Latino, Multiethnic) had less than thirty participants, it is possible that there were simply not enough data to adequately test for racial differences in this sample.

**In coping.** In contrast to past studies that showed the effect of coping differing between gender groups (e.g., Liang et al., 2007), the results of the current study did not find significant gender differences in the effectiveness of coping either during the recovery or coping periods. The results also failed to reveal racial differences in the effectiveness of coping, either during coping period or recovery period. This is incongruent with prior research showing that certain coping strategies were more effective in one racial group than the other (Noh et al., 1999). The equal effectiveness of both coping conditions across different racial groups in the current study might have resulted from either small sample sizes of the different ethnic groups or the possible unintended reappraisal effects of the passive acceptance condition, which may have inadvertently made this a more effective coping condition, although previous work has suggested that reappraisal may not always be helpful in the context of discrimination (Perez & Soto, 2011; Soto et al., 2012)

Moreover, introducing gender and race to regression models for either Hypothesis 1 or 2 made once-marginally significant models become non-significant. This pattern suggest that the
impact of racial discrimination and the effectiveness of coping differ importantly by race and gender, but the present study did not have a large enough sample size to further examine the effects. Future research can consider studying the effect of coping for specific racial groups or gender groups, or the intersection between race and gender.

**Limitations and Future Directions**

Overall, this study represents a step forward in examining the role of trait anxiety in response to racial discrimination and the effectiveness of two specific, but distinct, coping strategies within a context of racism. However, there were a number of limitations worth mentioning. One significant limitation of this study was the relatively small sample size of each racial group and male participants, which likely contributed to insufficient power and restricted the analyses that could have been performed. For example, with a larger sample size analyses could have been done to examine the interaction effects of gender × race, and gender × race × trait anxiety on changes in physiological activity and self-reported affect after the feedback was given and after the coping.

**Manipulation concerns.** Although 76 out of 125 participants (approximately 61%) considered the feedback to be racially discriminatory, 49 (nearly 40%) participants denied recognizing it as such. Although these 49 participants were dropped from the current study, it is worthwhile to explore reasons that could explain the discrepancy in perceived racial bias. First, a number of participants (either international or domestic students) reported that they had never experienced racial discrimination. The lack of similar experiences might have influenced their ability to detect racism. Many of these participants reported that they thought the phrase “you people” referred to their age or their identity as a college student. Additionally, the phrase “you people” might have been too vague to be racially discriminatory. Some participants without
experience of perceived racial discrimination stated during the debrief phase that they would have thought the feedback was racially biased if the phrase was directed specifically at their racial identity (e.g., “you Asian”, “you Puerto Rican”). Second, although the discriminatory situation was created as close as possible to what one might experience in real life, the nature of experiments may still be too artificial for the participants. Some participants (even those with a history of perceived racism) stated that the feedback could not be discriminatory because they were completing an experiment, which was a professional setting to them.

**Concerns of adding a speech task.** Although the feedback was effective enough in increasing self-reported anger and annoyance, self-reported stress and anxiety surprisingly decreased after the feedback was given. Moreover, trait anxiety did not moderate physiological reactivity from pre-post feedback, which was in contrast to Hypothesis 1. Considering that the feedback was given after the completion of the speech task and that adding a speech task can cause anxiety and stress among participants (Cho et al., in press), it is possible that the feedback provided a sense of closure of the speech task to the participants rather than introducing racial discrimination. Therefore, adding a speech task might have interfered with the effects of feedback and trait anxiety even later during coping and recovery periods.

To address these concerns, future studies may design a more lifelike situation to introduce racial discrimination and avoid adding a strong stressor such as public. For example, Lee et al. (2012) examined ethnic minority women’s responses to racism by asking participants to engage in an online conversation, where a confederate shared racially biased opinions about dating (i.e., “dating Black/Asian is painful”, p.923) to participants. Lee et al. (2012) reported that participants perceived the confederate’s behaviors as more racist than rude. Moreover, even when using speech task to create a lifelike situation, researchers could casually ask participants
to briefly talk about themselves instead of explicitly introducing the phrase “speech task,” which could enhance the level of stress in anxiety-prone individuals (Cremers et al., 2015).

**Coping concerns.** The ineffectiveness of confronting and passive acceptance among individuals with increasing trait anxiety during recovery might have been limited by the specific kinds of strategies used in this study. Using strategies such as meditation might be more effective for this population to regulate their physiological and psychological responses to stress. More studies are needed to examine the effectiveness of other specific strategies among people with different levels of trait anxiety.

Lastly, assigning participants to specific coping conditions produced some meaningful results, however, participants were not provided with an option to choose their preferred response. Research has shown that levels of trait anxiety can have an impact on individuals’ choices of strategies to regulate their emotions (Cho et al., in press). Although the effect of match/mismatch between preferred strategies and assigned coping conditions was not significant, future studies may nevertheless opt to give participants the freedom to choose their preferred strategies to cope with discriminatory stress.

**Clinical Implications**

Despite having some limitations, the current study could have important implications for counseling and clinical practice. The results indicated that anxiety-prone individuals may have an inadequate ability to regulate their emotions in response to stressors such as racial discrimination (Amstadter, 2008). By understanding this, counselors could help clients recognize the influence of latter’s anxiety level and become aware of the importance of developing effective coping strategies for different stressors.
Additionally, while confronting is typically viewed as an adaptive response to racism and passive acceptance as maladaptive, the findings of the current study actually revealed that the effectiveness of these two strategies (during coping period) varied based on trait anxiety level. For counselors working with individuals who are at risk of developing high anxiety or anxiety disorders, instead of educating clients on which strategies could be used to cope with racial discrimination, counselors might instead work with clients collaboratively to explore effects of different coping strategies in regulating anxiety. They could also help clients to pay attention to their bodily reactions when applying coping strategies so that clients could be more aware of the effects of these strategies. Furthermore, considering the ineffectiveness of coping in facilitating emotional recovery for individuals with increasing trait anxiety, counselors working with this population need to explore with the clients what could help the latter to more effectively apply coping strategies for racial discrimination.

Lastly, considering that the psychological and physiological effects of coping strategies among individuals with different levels of trait anxiety were not congruent, counselors could incorporate biofeedback in their work with clients to help the latter become aware of the incongruence between their bodily and emotional reactions to stressors such as racial discrimination. Past studies (e.g., Ratanasiripong, Sverduk, Prince, & Hayashino, 2012) have noted the effectiveness of using biofeedback training in counseling to help manage anxiety symptoms in clients. It is hoped that by developing awareness of their physiological activity, clients could gradually learn to monitor and manage their bodily functions in respond to stress.

Conclusion

Prior literature has produced inconsistent findings regarding coping strategies for racial discrimination (e.g., Dorr et al., 2007; Noh & Kasper, 1999; Sanchez et al., 2016). Researchers
have suggested more studies are needed to examine the effect of individual differences, especially trait anxiety, in response to and coping with racial discrimination. In this study, findings revealed that the effectiveness of confronting and passive acceptance varied by trait anxiety and different coping periods (i.e., coping period and recovery period). The findings presented here highlight the importance of examining individual differences in responding to racial discrimination and support the individual variability in the effectiveness of specific coping strategies.
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https://doi.org/10.1037/0002-9432.77.3.370


CONSENT FOR RESEARCH
The Pennsylvania State University

Title of Project: Emotions Relating to Incorporating Feedback

Principal Investigator: Ying Yang

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Telephone Number: (352) 665-3297

Advisor: Jose Soto, Ph.D.

Advisor Telephone Number: (814) 865-9515

Subject’s Printed Name: _____________________________

We are asking you to be in a research study. This form gives you information about the research. Whether or not you take part is up to you. You can choose not to take part. You can agree to take part and later change your mind. Your decision will not be held against you. Please ask questions about anything that is unclear to you and take your time to make your choice.

1. Why is this research study being done?
We are asking you to be in this research because you are at least 18 years old and self-identify as a college student. The purpose of the study is to examine how individuals naturally feel about, understand, and incorporate feedback. In particular, we are interested in the emotions that people feel and the bodily reaction that occurs with these emotions. After the experiment is over, we can provide more details about the specific goals of the study. At that point, you will have an opportunity to ask additional questions about the study and its purpose. By doing so after the experiment is over we can assure that your responses during the experiment are authentic and confidential.

2. What will happen in this research study?
If you consent to participate, we will be asking you to complete some questionnaires, perform an academic task for which you will receive feedback, and rate your response to the feedback. There are two parts of the study. You will first perform a task. While doing the task, we will videotape your behavior and record your bodily reactions using sensors placed on your torso and hand. Your data, together with those from many other participants, will be used to understand how certain ways of incorporating feedback can affect our emotional responses and how those responses can affect our functioning. After you complete the task, you will complete a series of online questionnaires using the provided laptop.

3. What are the risks and possible discomforts from being in this research study?
In participating in this research, you should experience no more discomfort than you normally would experience when performing academic tasks that are either pleasant or unpleasant. Possible risks include
eye fatigue and/or bodily fatigue from sitting in front of a computer for extended time. You may ask to stop the task be stopped at any point should you find it too upsetting. There may be minor discomfort in separating the sensor adhesive from the skin when removing sensors. There is no risk of electrical shock. You may also experience discomfort when receiving feedback regarding your performance because feedback may be positive and negative. You may choose not to answer any questions that you do not want to and you can stop your participation at any time.

A small fraction of participants have skin allergies that make them sensitive to the electrode gel and/or skin cleanser used in this research. These allergies typically result in a mild redness that goes away on its own once the gel or cream is removed. The surgical tape used to hold the electrodes on your skin may also leave a temporary pink mark when removed, much like a Band-Aid.

There is a risk of loss of confidentiality if your information or your identity is obtained by someone other than the investigators, but precautions will be taken to prevent this from happening. The confidentiality of your electronic data created by you or by the researchers will be maintained to the degree permitted by the technology used. Absolute confidentiality cannot be guaranteed.

4. What are the possible benefits from being in this research study?
   4a. What are the possible benefits to you?
   We hope to use the information gained in this study to improve our knowledge of how different people emotionally experience and respond to feedback. By participating in this study, you may develop a better understanding of the thoughts, behaviors, and emotions that you experience every day. Additionally, you may learn potentially better ways to respond to feedback.

   4b. What are the possible benefits to others?
   The benefits to society include gaining a better understanding of how individuals regulate their emotional reactions to feedback, which has the potential to inform health programs and practitioners on how to better tailor psychological interventions to help individuals with their emotions.

5. What other options are available instead of being in this research study?
You may decide not to participate in this research.

6. How long will you take part in this research study?
The study will last for one session of approximately 60 to 90 minutes.

7. How will your privacy and confidentiality be protected if you decide to take part in this research study?
Your participation in this research is confidential. Your email address will only be collected for scheduling purpose. It is recommended that you complete the online survey in a private place. The data will be stored and secured in the Moore Building on a secure server. Any information that is obtained in connection with this study that can be linked to your identity will remain confidential and will not be disclosed without your permission (i.e., video recordings). Furthermore, personally-identifiable information that is collected will not be matched to any other information you provide, including your responses to the task and feedback or computer questionnaires. The data, including video recordings will be stored for three years and will be destroyed three years after the study has been closed.

In the event of any publication or presentation resulting from the research, no personally identifiable information will be shared. All self-report and physical measures collected from this study will be averaged across participants and individuals will not be singled out. The Pennsylvania State University’s Office for Research Protections, the Institutional Review Board, and the Office for Human Research
Protections in the Department of Health and Human Services may review records related to this research study.

If you provide permission for us to do so, we would like to be able to use behavioral data (video recordings) obtained during the experimental portion of the study for publication purposes. By consenting to this research, we will be using the video recordings for publication purposes.

In the event of any publication or presentation resulting from the research, no personally identifiable information will be shared.

We will do our best to keep your participation in this research study confidential to the extent permitted by law. However, it is possible that other people may find out about your participation in this research study. For example, the following people/groups may check and copy records about this research:
- The Office for Human Research Protections in the U.S. Department of Health and Human Services
- The Institutional Review Board (a committee that reviews and approves research studies)
- The Office for Research Protections.

Some of these records could contain information that personally identifies you. Reasonable efforts will be made to keep the personal information in your research record private. However, absolute confidentiality cannot be guaranteed.

8. Will you be paid or receive credit to take part in this research study?

If you are recruited from the Department of Psychology’s Subject Pool, you will be provided 1.5 course credits for participating in the study. You will receive course credit for participating as specified in the syllabus provided by your instructor. Alternative means for earning this course credit are available as specified in the syllabus.

If you are recruited from sources other than the Department of Psychology’s Subject Pool, you will be paid $10/per hour for participating in the study.

9. What are your rights if you take part in this research study?

Taking part in this research study is voluntary.
- You do not have to participate in this research.
- If you choose not to participate in this research, you have the right to stop at any time.
- If you decide not to participate in this research or if you decide to stop at a later date, there will be no penalty or loss of benefits to which you are entitled.

10. If you have questions or concerns about this research study, whom should you call?

Please email the head of the research study (principal investigator), Ying Yang at yvy5235@psu.edu if you:
- Have questions, complaints or concerns about the research.
- Believe you may have been harmed by being in the research study.

You may also contact the Office for Research Protections at (814) 865-1775, ORProtections@psu.edu if you:
- Have questions regarding your rights as a person in a research study.
- Have concerns or general questions about the research.
- You may also call this number if you cannot reach the research team or wish to offer input or to talk to someone else about any concerns related to the research.
11. Injury Clause: In the unlikely event that you become injured as a result of your participation in this study, medical care is available. It is the policy of this institution to provide neither financial compensation nor free medical treatment for research-related injury. By signing this document, you are not waiving any rights that you have against The Pennsylvania State University for injury resulting from negligence of the University or its investigators.

You must be 18 years of age or older to take part in this research study. If you agree to take part in this research study based on the information outlined above, please sign your name and indicate the date below. You will be given a copy of this signed and dated consent form for your records.

Your participation is voluntary, and you may decide to stop at any time. You do not have to answer any questions that you do not want to answer.

INFORMED CONSENT TO TAKE PART IN RESEARCH

Signature of Person Obtaining Informed Consent

Your signature below means that you have explained the research to the subject or subject representative and have answered any questions he/she has about the research.

______________________________  __________  __________________
Signature of person who explained this research  Date  Printed Name
(Only approved investigators for this research may explain the research and obtain informed consent.)

Signature of Person Giving Informed Consent

Before making the decision about being in this research you should have:
  ● Discussed this research study with an investigator,
  ● Read the information in this form, and
  ● Had the opportunity to ask any questions you may have.
Your signature below means that you have received this information, have asked the questions you currently have about the research and those questions have been answered. You will receive a copy of the signed and dated form to keep for future reference.

Signature of Subject

By signing this consent form, you indicate that you voluntarily choose to be in this research and agree to allow your information to be used and shared as described above.

______________________________  __________  __________________
Signature of Subject  Date  Printed Name

______________________________  __________  __________________
Person Obtaining Consent  Date  Printed Name
Appendix B

Written Debriefing

Title of Project: Emotions Relating to Incorporating Feedback

Principal Investigator: Ying Yang, 317 CEDAR Bldg, 352-665-3297, yvy5235@psu.edu
Faculty Advisor: José Soto, 254 Moore Bldg, 814-863-0382, josesoto@psu.edu

The proposed study provides an experimental test of two types of responses to discrimination: passive acceptance and confrontation. The study aims to investigate how minority individuals respond to discrimination under varying states of anxiety. The investigators will use multiple surveys and measure physiological arousal before discrimination, during discrimination, and after discrimination.

Please be especially aware that the feedback you received was fictitious and not an accurate representation of your performance. All participants receive the exact same “feedback” from the exact same “lead judge” (a character created for this study). In addition, your speech was not actually evaluated for persuasiveness, content, and style by the research assistants. This deception was necessary in order to achieve the desired emotion induction and to help make this situation and the emotions experienced as close as possible to what one would experience in real life.

Past research has suggested that discrimination can impact individuals’ psychological and physical health. It can also hinder individuals’ behaviors, especially coping strategies and responses to discrimination. Researchers have reported that discrimination was associated with passive avoidance and confrontation coping strategies in minority individuals. In addition, unhealthy responses could lead to higher risk of developing mental health problems such as major depression in individuals.

This study examines the relationships between anxiety, discrimination, and response to discrimination. Data from this study will help further our understanding of how individual differences affect the ways we response to stressful situations, especially in the face of discrimination, and will be used to guide future research and psychological treatment.

You now have the choice of either having your data included in the research study, or to be withdrawn from the research study. If you choose to withdraw from this research study, your data will be shredded and disposed of in your presence.

If you have any questions about the study, you are encouraged to contact the principal investigator, Ying Yang, or her research supervisor, Dr. José Soto, at their above contact information. Thank you for participating!

Importantly, we ask that your refrain from talking about the study with others. This is because we will be collecting responses throughout the year and results would be adversely affected if others knew the purpose of the survey prior to completing it. Thank you.
If you feel a need to speak to a professional concerning any uncomfortable feelings from your participation in this research, you may contact the Counseling & Psychological Services (CAPS) at 814.863.0395; or the Centre County CAN HELP line at 800.643.5432
VITA

Ying Yang

Education

August 2019  Doctor of Philosophy in Education (Ph.D.) (CACREP accredited)
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May 2015  Master of Education (M.Ed./Ed.S.) (CACREP accredited)
Counselor Education - Mental Health Counseling Track
University of Florida

July 2011  Bachelor of Science (B.S.)
Applied Psychology
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Counseling and Supervision Experiences

Aug. 2017-May 2019  Mental Health Counselor, Dr. Edwin L. Herr Clinic,
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Jan. 2016-April 2016  Career Counselor, Career Service Center, Pennsylvania State University, State College, PA

Aug. 2015-Dec. 2015  Mental Health Counselor, Dr. Edwin L. Herr Clinic,
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Aug. 2014-May 2015  Mental Health Counselor, A. Quinn Jones Center,
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