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**EXPRESSIVE SUPPRESSION OF NEGATIVE EMOTION: A COMPARISON
OF ASIAN AMERICAN AND EUROPEAN AMERICAN NORMS
FOR EMOTION REGULATION**

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Psychology

by

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ABSTRACT

Emerging research points to the need for cross-cultural clarification of the consequences of emotion regulation. Although much empirical work has documented the benefits of expressing emotions and the downsides of suppressing emotions, suggesting expression may be universally adaptive, such research sets up East Asian cultural contexts, where the use of suppression is more positively regarded, to be mistakenly perceived as promoting unhealthy practices when compared to the norms within Western cultural contexts. The current research employed psychophysiological, behavioral, and self-report measures in order to better understand the consequences of emotion regulation for a sample of Asian and European Americans. In a within subjects design, participants watched emotionally evocative films and were asked to engage in expressive suppression or amplification of their emotional responses. There were no group differences in level of emotion displayed when asked to suppress emotional reactions, however, when asked to amplify their reactions, the European Americans more readily displayed their emotion than Asian Americans. Physiological reactivity and recovery results generally supported predictions regarding the benefits of suppression for Asian Americans and the utility of expression for European Americans. These findings suggest further cross-cultural work is needed to better understand the variety of consequences of emotion regulation strategies.

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Chapter 1

INTRODUCTION AND LITERATURE REVIEW

Expressive Suppression of Negative Emotion: A Comparison of Asian American and European American Norms for Emotion Regulation

Emotion regulation has been linked to a number of important outcomes, including well-being, social functioning, and various indicators of physical and mental health (Engebretson, Matthews, & Scheier, 1989; Gross & Muñoz, 1995; John & Gross, 2004). Specifically, past research has shown that suppressing one's emotional expressions (commonly referred to as suppression, expressive suppression or emotional inhibition) is associated with numerous negative outcomes such as increased physiological arousal, increased risk for depression, impaired memory, disrupted interpersonal functioning, diminished expression and experience of positive emotion, decreased immune system functioning, and decreased satisfaction with life (Butler et al., 2003; Gross & John, 2003; Gross & Levenson, 1993; Petrie, Booth, & Pennebaker, 1998; Richards & Gross, 2000; Wenzlaff, Rude, Taylor, Stultz, & Sweatt, 2001). To a large extent, the findings above reflect the historical focus on individual differences in the study of emotional reactivity and regulation (Gross & John, 2003). Emerging evidence suggests that culture may also be an important contextual variable to consider with regard to emotion regulation (Perez & Soto, 2011; Soto, Perez, Kim, Lee, & Minnick, in press). For example, cultures prescribe different norms that shape what emotions we should feel, under which circumstances, and how and when we express those emotions (Matsumoto, Yoo, & Nakagawa, 2008; Tsai, 2007). A logical extension of this work is that culture can affect health by virtue of its influence on how emotions are regulated in everyday life.

Recently, empirical studies on the consequences of emotion regulation across different cultural groups have revealed that the outcomes associated with certain emotion regulation strategies are not universal (Mauss & Butler, 2009; Perez & Soto, 2011). In particular, the extent to which suppression is associated with maladaptive outcomes may vary across cultural contexts. In an Asian cultural context, where suppression is more normative (relative to Western cultural contexts), the relationship between suppression and negative outcomes may be attenuated (Butler, Lee & Gross, 2007; Soto et al., in press). This variation makes sense given that cultural norms have been passed down over generations presumably because they are adaptive within that particular cultural context. Nevertheless, Western society and its representative institutions (e.g. the mental health care system, the educational system) have typically prescribed a one-size-fits-all approach toward suppression suggesting that it is healthier to express than to suppress. Adhering to this prescription might lead one to expect that cultural groups with norms that encourage the use of suppression could be particularly at risk for negative outcomes. However, the notion that people of Asian cultural backgrounds may have a greater likelihood of negative health outcomes because of their tendency toward suppression has received little empirical attention. Unpacking this assumption is warranted in light of recent findings that challenge it (Consedine, Magai, & Bonanno, 2002), and because of the dearth of empirical tests of this notion. In order to better understand the contextual influences on the consequences of suppression, the present study examines how two culturally distinct groups (European Americans and Asian Americans) differ in their psychophysiological responses (a possible marker for long-term health) when asked to suppress their emotions in a laboratory setting.

Emotion Regulation and Health

Stress occurs when we perceive some stimulus as taxing our resources, and therefore, coping strategies are marshaled in an attempt to effectively and efficiently manage the stressful situation (Lazarus, 1993). One of the coping mechanisms often used in response to stressful situations is a conscious effort to control the emotional reactions resulting from those situations. For example, during an argument, one may suppress the display of intense anger in order to avoid escalating the fight or another example is that after just being embarrassed, one may suppress the display of sadness and the urge to cry in order to avoid garnering even more negative attention. While these strategies may seem most pertinent for our short-term health, the cumulative effects of heightened physiological reactions to short-term stress can also threaten long-term health outcomes (Krantz & Manuck, 1984; Mauss & Gross, 2004). In other words, chronically experiencing increased reactivity levels and slow recovery times can be harmful in the long-term. In fact, research examining the ways we regulate our emotions has studied the use of suppression as well as expression (uninhibited emotional responding) and have linked various health outcomes with use of each of these strategies.

Expressing Emotions and Health. The prevailing view in the emotion regulation-health literature asserts that expression is an adaptive strategy for managing our health. This perspective has a long history within psychology that traces back to Freud's psychodynamic theory about healing via catharsis (Breuer & Freud, 1957; Hokanson, Willers, & Koropsak, 2006; Pennebaker & Beall, 1986). Expression can be thought of as an emotion regulation strategy characterized by allowing one to display one's emotions freely¹. Expression can serve multiple functions such as facilitating communication with others and motivating individuals to engage in adaptive behaviors (Consedine et al., 2002; Polivy, 1998). Perhaps the most well

known work on the expression-health link has been conducted by Pennebaker and colleagues who suggest that the benefits of expression are mediated by enhancement of our immune system (Esterling, Antoni, Fletcher, Margulies, & Schneiderman, 1994; Pennebaker & Seagal, 1999). In studies where participants were encouraged to express themselves in writing, particularly about the negative emotions associated with traumatic events, these acts of expression led to enhanced immune system functioning and decreased pain, stress, and depression (Pennebaker & Francis, 1996; Petrie, Booth, & Pennebaker, 1998). Additionally, expressing oneself by creating narratives of our past assists with the memory processing of aversive events and the management of the distress associated with those events (Pennebaker & Francis, 1996). From this perspective, expression facilitates interpersonal communication, adaptive coping behaviors, immune system functioning, and cognitive processing.

Although much work has documented the link between expression and positive health outcomes, there are reasons to expect expression to be maladaptive under certain circumstances. By displaying our internal states, especially for a prolonged period of time, we may actually undermine interpersonal relationships. Expression may result in increased feelings of negative affect, such as despair, and increased risk of losing social support (Consedine et al., 2002). Work that has specifically examined how physical health relates to the expression of anger has linked such expression with increased risk of coronary heart disease (Williams et al., 1980) and hypertension (Harburg, Blakelock, & Roeper, 1979). Furthermore, other work demonstrates that external expression of one's internal thoughts can actually disrupt cognitive functioning, at least for certain populations such as Asian Americans (Kim, 2008). Such problems associated with expression undermine the idea that the expression of emotions is "natural" (Polivy, 1998) and that expression is useful across all emotions and for all populations. For example, past work on

race and emotion expression showed that European Americans who were asked to express anger showed faster physiological recovery, which presumably is better for physical health, than African Americans who expressed anger (Dorr, Brosschot, Sollers, & Thayer, 2007). In this case, the benefits of expression did not apply universally for a diverse sample. Thus, given that there is reason to suspect expression does not always lead to positive health outcomes, examining which emotion regulation strategies are helpful for what populations would advance the literature on emotion regulation and health.

Suppressing Emotions and Health. A discussion of the suppression-health link must start with clarification on the construct of suppression itself. Similar to expression, suppression can apply to both dampening the feeling and the display of an emotion. Conceptually, suppression overlaps with denial and repressive coping, as well as behavioral inhibition and display rules (Consedine et al., 2002). The same construct (hereafter, suppression) has been called both expressive suppression (Gross, 1998) and inhibition (Consedine et al., 2002) and is considered a response-focused type of emotion regulation strategy in that it is employed after we have both appraised and reacted to an emotional event (Gross, 1998). One of the critiques of past work examining the relationship between expression and health is that researchers have not always explained how expression and suppression are linked (Gross & Levenson, 1993). A logical assumption to make is that expression and suppression are opposite ends of the same continuum, meaning that not expressing something implies inhibition must be operating. This understanding infers that not expressing something is an intentional act, however, a lack of expression does not necessarily implicate a conscious intent to suppress emotions. Furthermore, many studies that purport to demonstrate the benefits of expression and thus suggest the disadvantages of inhibition do not actually measure or manipulate inhibition (Consedine et al., 2002). Therefore,

the idea that the two strategies operate as opposites on the same continuum that result in opposite consequences is tenuous. Like Considine and colleagues (2002), I consider suppression to be related, yet distinct from expression, meaning that the absence of one does not necessarily imply the intentional activation of the other. Additionally, that the consequences of suppression are usually considered to be negative based on work demonstrating expression's benefits requires more examination to test this gross generalization.

Much evidence points to suppression being at best, disruptive, and at worst, bad for one's health. Suppression is believed by some researchers to cause an unsettling discrepancy between one's emotional experience versus expression, and this discrepancy prevents down-regulation of the emotional experience (Gross, 1998). Pennebaker and colleagues explain that suppression causes an increase in stress and ruminative thoughts (Pennebaker & Francis, 1996; Spera, Buhrfeind, & Pennebaker, 1994). Thought suppression could ironically backfire by making something more cognitively salient, a process that can adversely prolong physiological arousal (Brosschot, Van Dijk, & Thayer, 2007). Thus, repeated use of suppression may cause so much cognitive interference and disruption in regulating emotions that the compounding of stress mediated by various physiological mechanisms, such as weakening of the immune system, leaves people vulnerable to health problems such as depression and decreased well-being (Gross & John, 2003; Hamer & Malan, 2010; Wenzlaff et al., 2001). Interestingly, suppression's effects may differ depending on emotion valence with some research showing that suppression can decrease self-reported experience of positive emotions (Gross & John, 2003; Strack, Martin, & Stepper, 1988), yet maintain or even increase negative emotions (Gross & John, 2003).

The case that suppression is largely a maladaptive emotion regulation strategy has been built by numerous studies that show suppression of various emotions causes increased

physiological activation (Demaree et al., 2006; Gross & Levenson, 1993; Krantz & Manuck 1984; Richards & Gross, 2000) and delayed physiological recovery (Dorr et al., 2007). Much work has examined the immediate physiological consequences of suppressing negative emotions such as anger. When people who habitually express anger (anger-out people) are asked to suppress anger, the negative effects of increased physiological reactivity are exacerbated (Burns, Quartana, & Bruehl, 2007). Additionally, our ability to tolerate pain is diminished after having suppressed anger (Cioffi & Holloway, 1993). These short-term response patterns are often used as indicators of potential long-term health outcomes, which have also been well documented. For example, research has shown that habitual suppression is correlated with the progression of cancer (Garssen & Goodkin, 1999) and a continuous weakening of the immune system (Petrie, Booth, & Pennebaker, 1998).

An extension of the work on suppression concerns the link between short-term psychophysiological reactivity and long-term disease (Mauss & Gross, 2004). Mainly, it is believed that while one instance of suppression may not result in long-term harm, multiple instances of suppression can set in motion certain mechanisms that contribute to poorer health. The idea that repeated suppression can tax the cardiovascular system by repeatedly increasing reactivity levels (Blascovich & Katkin, 1993, Hamer & Malan, 2010; Krantz & Manuck, 1984) is supported by numerous studies that show suppression of anger is associated with health problems such as cardiovascular disease (MacDougall, Dembroski, Dimsdale, & Thomas, 1985) and chronic hypertension (Engelbreton et al., 1989; Jorgensen, Johnson, Kolodziej, & Schreer, 1996; Krieger, 1990; Suls, Wan, & Costa, 1995). Similarly, whereas one incident of suppression during an interpersonal exchange may not result in long-term harm, the consistent use of suppression is related to costs for interpersonal relationships. For example, suppression can

threaten interpersonal interactions by increasing stress levels and blood pressure and by disrupting communication and rapport building (Butler et al., 2003). Over time, both the experience of suppression and of the disrupted interactions are stressful, negating any potential benefits of a productive interpersonal relationship, and these conditions can adversely affect physiological functioning. Thus, suppression is problematic to the extent that its chronic use eventually undermines long-term health outcomes via the physiological system and diminished interpersonal functioning.

Overall, suppression has largely been implicated in undermining many different aspects of health, but less work has confirmed this finding across diverse populations. Namely, adverse physical consequences might be minimized by either expressing or suppressing, as long as the regulation matches one's preferred style, (Burns et al., 2007; Lai & Linden, 1992). Engebretson and colleagues (1989) posit a Matching Hypothesis such that the physiological consequences of suppression depend on whether a person habitually uses suppression. Here the variation in one's chronic use of suppression was conceived of as an individual difference, but also can be a norm that is supported or disapproved of within diverse cultures. For example, after suppressing, women showed lower reactivity compared to men, presumably due to the internalization of gender norms (Bjorklund & Kipp, 1996). Because suppression is the norm for women, the use of this culturally proscribed strategy did not result in the adverse consequences it did for men. Other work has examined differences between women who self-reported a tendency to either suppress or express their anger. The women who habitually suppress, which is in line with social expectations, showed the adaptive, faster physiological recovery after provocation compared to women who habitually express anger (Lai & Linden, 1992). Furthermore, Suchday and Larkin (2004) tested the physiological effects of expressing or inhibiting anger in a sample of East

Indian men. After suppression, which is considered in Indian culture to be a socially acceptable emotion regulation response, men recovered more quickly than after being instructed to express their anger. Lastly, although Mensah and Dunbar (2006) concluded that the use of suppression puts minorities at a higher risk for cardiovascular disease compared to European Americans, they were only referring to non-Asian minorities. Due to Asian culture's approval of suppression, Asian Americans were not considered at increased cardiovascular risk due to the use of suppression. Such work suggests that how suppression affects health across cultures is not completely understood.

Emotion Regulation and Culture

Cultural norms provide guidelines for interacting with our environment, which include how we react emotionally to various situations (Matsumoto, 1990; Mesquita & Frijda, 1992; Shweder, Haidt, Horton, & Joseph, 2008; Soto, Levenson & Ebling, 2005). Norms that govern emotion regulation are differentially valued and practiced by members of different cultures. For example, much research has examined the expression-suppression dimension as one around which there is much cultural variation. Cultures that are influenced by Western philosophy tend to promote the use of expression as an emotion regulation strategy, whereas cultures that are predominantly influenced by Eastern philosophy tend to endorse the suppression of emotions (Matsumoto et al., 2008; Tsai, Chentsova-Dutton, Freire-Bebeau, & Przymus, 2002). Such studies that ground the investigation of individual differences within a cultural context are relevant to the discussion of how cultural norms can ultimately affect health. Markus and colleagues (1997) have argued that a fundamental aspect of a healthy self is being able to enact culturally congruent ways of living, which makes the consideration of culture's role in the link between emotion regulation and health necessary. Below I present data from cross-cultural and

cross-ethnic investigations of preferred emotion regulation strategies, focusing specifically on Asian Americans, a population that is exposed to cultural norms that contrast dramatically from those norms of the surrounding mainstream American society.

Expression and Culture. The emphasis on free expression of emotions can be readily seen in individualistic cultures of the U.S. and many other Western nations (Hofstede, 1983; Triandis, 1993). The typical importance of individual autonomy over the collective may contribute to a preference for emotional expression over suppression. Although people are certainly members of and identify with different groups, identities are constructed primarily from an individual's choices, goals, and actions (Markus & Kitayama, 1991). Hence, Western contexts are environments where freely expressing oneself is both desirable and expected. By explicitly expressing their emotions, members of Western cultures are able to communicate their individual reactions to events and such expressions could also function as a way to differentiate themselves from others (Kitayama, Markus, & Kurokawa, 2000; Matsumoto et al., 2008; Mesquita, 2001). This sense of one's freedom to express emotions was demonstrated in classic work on the display of negative emotions. Ekman and Friesen, (1969) showed that European American participants watching a disgusting film expressed disgust both when the experimenter was and was not present, however, changes in the social context did affect Japanese participants' expressions. That the presence of another person did not inhibit the display of a negative emotional reaction is a reflection of the value European American culture places on expression.

Furthermore, the expression of emotions fits in with other Western norms that essentially protect the right to free expression. Work examining preferred coping styles has shown that European Americans advocate problem-focused coping, which is characterized by the person making constructive changes in one's behavior and/or one's environment (Lam & Zane, 2004)

and explicit social support, which involves self-disclosure of distress (Kim, Sherman, & Taylor, 2008). Expression fits with such coping styles that involve publicly engaging with a stressful situation and verbally communicating one's point of view to others. Similarly, cross-cultural work on conflict management shows members of Western cultures prefer assertiveness rather than compromise or avoidance (Gudykunst, Matsumoto, Ting-Toomey, & Nishida, 1996). In other words, the preferred way to solve interpersonal differences in an individualistic society is to openly express one's stance on the issue. The belief that emotional expression should be unfettered is also reflected in Tsai's (2007) work showing that European Americans consider high arousal emotional states (e.g. excited) ideal compared to low arousal states (e.g. content). Overall, within a Western context, social norms reinforce the value placed on expression.

Suppression and Culture. In contrast to the norms of a Western cultural context, the norms for collectivistic or Eastern cultural contexts encourage the suppression of one's emotion. Cross-cultural research examining nations typically characterized as collectivistic cultures (Hofstede, 1983; Triandis, 1993) tend to refer to much of Asia. Broad generalizations of what constitutes "Asian culture" are tenuous given that Asia is a vast continent composed of many unique ethnic groups. Nevertheless, most regions are influenced to some extent by the norms advocated by Confucianism and Buddhism, which lend itself to common ground among diverse ethnic groups. Within these cultural contexts, the expectation that individuals should integrate into a hierarchy highlights the value placed on cooperation, interdependence, and social harmony (Markus & Kitayama, 1991; Matsumoto et al., 2008). Thus, people must always exercise concern and awareness of how their behavior can affect others, and as a result, may lead to the restraint of emotional behaviors in order to keep the peace (Tsai, Miao, Seppala, Fung, & Yeung, 2007). Indeed, past work has shown that members of collectivist cultures endorse the

moderation of experienced and expressed emotions (Gross & John, 2003; Tsai, 2007) as well as hold specific beliefs about the situational appropriateness of suppression (Matsumoto, 1990). Whether to show an emotion depends on factors such as emotion valence and the relationship one has with a witness. For example, in the classic Ekman and Friesen (1969) study, Japanese participants privately watching a disgusting film displayed disgust comparable to European American participants. When the experimenter was present, however, Japanese participants suppressed their facial behavior presumably to avoid potential embarrassment to themselves or the experimenter. Suppression, therefore, is adaptive by minimizing an emotion's potential to escalate a conflict or to disrupt an interpersonal relationship.

The value placed on suppression fits with other norms encouraged in an Eastern cultural context. Emotion-focused coping, the internal managing of one's appraisals and emotions in reaction to a situation, and disengagement coping, which includes strategies such as problem avoidance or social withdrawal (Carver, Scheier, & Weintraub, 1989) fit with the tendency to downplay one's emotions. Both emotion-focused and disengagement coping involve not imposing external changes on the environment or other people and is preferred by those of Asian descent (Chang, 2001; Lam & Zane, 2004). Other work suggests seeking social support is considered culturally appropriate coping so long as one does not explicitly self-disclose one's distress (Kim et al., 2008). Rather, reaffirming one's relationships with others is viewed as a proper way of soliciting implicit support when dealing with personal troubles. Moreover, the preferred styles of conflict resolution within an Eastern cultural context serve to minimize clashes in interpersonal relationships. Members of collectivistic cultures would want to handle a negative situation in such a way so that no parties involved suffer embarrassment, sometimes making the withholding of negative expressions necessary. Therefore, through conflict

management strategies such as compromise (Ting-Toomey et al., 2000), peaceful resolutions can be achieved in order to maintain a harmonious status quo. Suppression, therefore, functions as an emotion regulation strategy that reinforces norms that promote interdependence.

Evidence within clinical psychology further suggests the cultural norm for Eastern contexts is to suppress emotions, whereas the cultural norm for Western contexts is to express emotions. Similar to the Matching Hypothesis (Engebretson, et al., 1989) on the effects of individual differences in emotion regulation, Chentsova-Dutton and colleagues (2007, 2010) describe the Cultural Norm Hypothesis, which asserts that the ability to enact cultural norms for emotion is a marker of health. Specifically, people with a mental illness such as depression are cognitively and affectively preoccupied, and therefore exhibit symptoms of dysfunctional emotion regulation (e.g. chronic lack of positive affect). This reduced capacity to regulate emotions could lead to enacting culturally incongruent behaviors, for example, crying at inappropriate places. Thus, Chentsova-Dutton and colleagues (2007, 2010) tested whether depression would interfere with one's ability to experience and/or express emotions in culturally consistent ways. Her findings showed that Asian Americans with depression actually *expressed* their positive or negative emotions more than Asian Americans without depression. Likewise, European Americans with depression *suppressed* their positive or negative emotions compared with European Americans without depression. These studies suggest that a crucial link exists between health and one's capacity to enact culturally normative emotion regulation behaviors. Namely, the use of suppression and expression by Asian Americans and European Americans respectively, contributes to positive health outcomes.

Health Implications for Cultural Differences in Emotion Regulation

The literature exploring emotion regulation's relationship with health implies that certain populations may be vulnerable to poorer health due to cultural norms endorsing suppression. Although members of Asian cultural groups tend to prefer the use of suppression compared to other emotion regulation strategies, even among Asian Americans, that is, Asian ethnic group members within the U.S., also report using suppression more often compared to European Americans (Butler, et al., 2007; Gross & John, 2003; Soto et al., in press). Therefore, Asian Americans are situated within a greater social context where their preferred emotion regulation strategy may be considered maladaptive.

Past work has begun to elaborate on how suppression may not always be maladaptive; rather the use of culturally incongruent coping is what results in adverse consequences for the self (Markus, et al., 1997). For example, within the domain of coping with perceived discrimination, an investigation of Southeast Asian immigrants in Canada found that those who tended to use emotion-focused coping methods were buffered from negative mental health outcomes (Noh, Beiser, Kaspar, Hou, & Rummens, 1999). Specifically, suppressing emotional behavior in order to cope with discrimination was effective in diminishing the link between discrimination and depression, especially the more they identified with their Asian ethnicity. Thus, not only have Asians shown a preference for coping strategies that focus on internal changes in response to a stressor (Lam & Zane, 2004) such as suppression, but they seem to benefit from its use. Additionally, level of ethnic identification could be an important moderator that needs to be examined in tandem with investigations of how cultural emotion regulation norms affect health.

Lastly, work examining the associations among different emotion regulation strategies

has found that within Eastern cultures, suppression positively correlates with reappraisal, whereas in Western cultures, this relationship is negative (Matsumoto et al., 2008). Because reappraisal is a strategy that is considered universally adaptive (Gross & John, 2003; Schutte, Manes, & Malouff, 2009), these cross-cultural studies further challenge the notion that negative outcomes are necessarily associated with suppression. The present research explores how using culturally congruent or incongruent emotion regulation implicates health as indexed by reactivity to and recovery after a stressful event for a sample of Asian Americans and European Americans.

Methodological Considerations

Based on the idea that the cumulative effects of heightened physiological activation due to suppression can affect health, short-term physiological reactivity can be used as a marker of long-term health (Blascovich & Katkin, 1993; Heponiemi et al., 2007; Krantz & Manuck, 1984; Mauss & Gross, 2004). Typically, when we perceive a stressor, we evaluate our coping resources and our body becomes primed to take action (Lazarus, 1993). Our sympathetic nervous system (SNS), responsible for activating the fight-or-flight response, allocates our energy towards vital physiological processes that will allow us to react efficiently. Researchers have found that patterns of SNS activation vary in their association with better or worse health outcomes (Manuck, Kamarak, Kasprovicz, & Waldstein, 1993). Consequently, by tracking such reactivity patterns during emotion regulation, we can approximate the physiological costs and benefits assumed to relate to long-term health outcomes.

The use of short-term reactivity as an indicator of long-term health outcomes is only one possible research approach that lends itself to testing theories that seek to account for the long-term consequences of emotion regulation (Mauss & Gross, 2004; Mensah & Dunbar, 2006).

What has typically been practiced is that studies only compare the *reactivity* during an emotional experience to a pre-emotional event baseline, whereas comparatively less work has also observed *recovery* after an emotional stimulus was presented (Chida & Hamer, 2008; Linden, Earle, Gerin, & Christenfeld, 1997; Pieper & Brosschot, 2005). To better understand the consequences of emotion regulation, it behooves researchers to consider evaluating the efficiency of regulation strategies since an effective strategy might not just reduce reactivity levels *during* presentation of a stressful stimulus, but also may hasten the time it takes for these levels to return to baseline (recovery period) *after* the stimulus is presented (Fredrickson & Levenson, 1998; Haynes, Gannon, Orimoto, O'Brien, & Brandt, 1991). That there is no major consensus on how best to operationalize recovery suggests this is an untapped area within the health literature in much need of exploration. Examining recovery period may present a greater opportunity to observe cultural influences given that individuals are free to respond to the experience of having regulated their emotions in ways that are likely affected by culture (Levenson, Soto, & Pole, 2007). Furthermore, in Eastern cultural contexts, the emphasis on attending to the enduring effects of emotional experience indicate that recovery time may be a particularly meaningful measure in studying the consequences of suppression.

Additionally, an important extension of past work to note is the use of a within-subjects design, allowing the measurement of reactions to both the suppression and expression of negative affect. Although spillover effects may occur over the course of the experiment and could be considered a source of error, the advantage of a within-subjects design is that psychophysiological profiles can be compared across emotion regulation instructions to account for individual differences in overall responding, a source of variation that past studies employing between-subjects designs could not account for. Furthermore, we adopt a mixed-methods

approach to measuring emotion and its regulation by examining self-report, physiological and behavioral data.

The Present Study

In sum, previous work on the health consequences of emotion regulation has not fully explored cross-cultural implications. Much empirical work has documented the benefits of expression versus the downsides of suppression, implying that expression is universally adaptive. This finding sets up a situation where Eastern cultural contexts, which encourage the use of suppression, may be mistakenly assumed to promote unhealthy practices when compared to Western cultural contexts. Emerging research points to the need for cross-cultural clarification (Soto et al, in press; Noh et al., 1999). Given the focus of previous research on the consequences of regulating emotion, this research seeks to extend past work by examining the behavioral, self-reported, and physiological responses of Asian Americans and European Americans, two cultural groups that should differ in their approach to regulating emotions, as they use specific emotion regulation strategies to respond to and recover from a series of emotion inductions.

The present study employed a common paradigm for inducing emotions by showing film clips. Specifically, participants watched clips that elicit a disgust reaction preceded by one of three possible sets of instructions: 1) watch carefully (control), 2) suppress emotion, or 3) amplify emotion. These instructions served as the manipulation of emotion regulation and were the within-subjects variable. The various conditions allowed for methodologically parsing the effects due to the nature of the film (i.e., disgust reaction) versus the effects of employing a specific emotion regulation strategy (i.e., suppression versus amplification). Three types of emotional response data were assessed: 1) nonverbal displays of emotion during film presentation, 2) physiological responding during and after film presentation, and 3) self-reported

emotion ratings collected after film presentation allowing us to examine a full range of emotional responses.

Hypotheses

Hypothesis 1: Asian Americans would display less disgust behavior, show less physiological reactivity, and report less disgust than European Americans. This group difference would be more pronounced in the suppression condition relative to the watch condition.

Hypothesis 2: After the suppression condition, Asian Americans' physiological response would recover to pre-film baseline levels more quickly than European Americans' response.

Hypothesis 3: European Americans would display more disgust behavior, show more physiological reactivity, and report more disgust than Asian Americans. This group difference would be more pronounced in the amplification condition relative to the watch condition.

Hypothesis 4: After the amplification condition, European Americans' physiological response would recover to pre-film baseline levels more quickly than Asian Americans' response.

Hypothesis 5: The effects predicted in Hypotheses 1-4 would be moderated by ethnic identity such that increased identification with one's cultural in-group would accentuate the difference between groups. In other words, regarding Hypotheses 1 and 2, more highly identified Asian Americans would display less disgust, show less reactivity, report less disgust, and show faster recovery during the suppression condition relative to less identified Asian Americans. Similarly, regarding Hypotheses 3 and 4, more highly identified European Americans would display more disgust, show less reactivity, report more disgust, and show faster recovery during the amplification condition relative to less identified European Americans.

The hypotheses above take into consideration that when given no instructions to regulate emotions, different cultural groups may default to their preferred regulation strategies possibly leading to differences in the observed response. Thus, one may predict that such group differences may be attenuated after instructions since the participants experiencing a culturally incongruent situation (e.g., European Americans asked to suppress) will be acting more like the participants experiencing a culturally congruent situation (e.g., Asian Americans asked to suppress). However, although participants may be equally adept at engaging in either suppression or amplification, the consequences of such regulation (i.e., the observed measures in the present study) are expected to be dependent on cultural background, which proscribes which strategies are preferred. Given backgrounds that endorse contrasting norms, Asian and European Americans are not expected to have comparable experiences when asked to regulate their emotions. Rather group differences should be enhanced and reflected at least in their physiological responses.

Chapter 2

METHOD AND PROCEDURES

Participants

A sample of 96 undergraduate students recruited from introductory psychology classes at a large university in the Northeastern U.S. consisted of 44 Asian American (Females, $n = 19$) and 52 European American (Females, $n = 33$) participants. An a priori power analysis conducted using G-power 3 based on an estimated medium effect size (Cohen's $d = 0.5$) and an alpha level of 0.05 indicated a necessary sample size of approximately 100 for sufficient power (0.8) to detect group differences. Therefore, it was assumed there should be a reasonable level of power with 96 participants. All participants were compensated with course credit or paid \$8 for their participation.

Apparatus

When participants arrived at the lab room, they were seated in a comfortable chair 3 feet away from a 19" LCD monitor, which was connected to a computer running E-prime software to collect self-report responses and to present instructions and stimuli for the experiment (see Procedures section). The participant lab room, designed to be inviting and comfortable, and a control room next door were equipped with an audio and video system to allow experimenters to communicate with and monitor the participants.

Self-Report Measures

Health Screener. Participants were asked about their use of substances that may affect physiological arousal such as caffeine, nicotine, over-the-counter and prescription medications, or illicit substances on the day of their participation. They also reported how many hours they had slept the previous night (see Appendix A, p. 57). This information was collected to ensure

the viability of the physiological data by eliminating data from any participants whose physiological responses may have been affected by any exceptional substance use or sleep disruption.

Ethnic Identity. Identification with one's racial/ethnic group was measured using the Collective Self-Esteem Scale (CSE; Luhtanen & Crocker, 1992). This 16-item scale consists of four subscales: Membership self-esteem, Private collective self-esteem, Public collective self-esteem, and Importance to identity (see Appendix B, p. 58). Only the responses for the Importance to identity subscale were of interest as this 4 item subscale is intended to measure the importance of one's ethnic background to the construction of one's self-concept (an example item: "The social groups I belong to are an important reflection of who I am"). Participants indicated their agreement with the CSE items utilizing a 7-point Likert type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) so. A Cohen's alpha of .92 in the present sample indicated the subscale exhibited excellent reliability.

Ratings of Emotion Before and After Films. Self-reported emotions were collected during the baseline assessment period (i.e., after measures described above), and after every film's recovery period thereafter. Participants were asked to use a 9-pt Likert scale (0 = *none* and 8 = *the most in my life*) to report their current experience of 16 different emotions: *amusement, anger, arousal, confusion, contempt, contentment, disgust, embarrassment, fear, happiness, interest, pain, relief, sadness, surprise, and tension*. Previous work has used this rating scale to measure the experience of various emotions (Ekman, Friesen, & Ancoli, 1980; Gross & Levenson, 1993), however, for this study, only the results for disgust are reported as this emotion was of primary interest.

Behavioral Measures

In order to collect data on participants' display of emotions, video cameras recorded participants' faces during all the film trials. Research assistants (3 Female European Americans, 4 Male European Americans) blind to which condition the participant was experiencing, rated the intensity of participants' displayed emotions using a 4-pt Likert scale (0 = *not at all*, 1 = *low*, 2 = *medium*, 3 = *high*). Separate ratings were made of participants' disgust, fear, surprise/shock, overall negative affect, and overall positive affect for the duration of each film, however, similar to the self-reported emotion measure, only the results for displayed disgust behavior are reported here as this emotion was of primary interest. Additionally, the raters noted whether participants asked to stop a film (see Appendix C, p. 59). Research assistants periodically met with their supervisor to ensure consistency in ratings and to resolve disagreement among raters. Intraclass correlation coefficients (ICCs) were calculated to test the inter-rater reliability of the research assistants who watched and rated all participants' films and indicated that inter-rater reliability was adequate for the ratings of disgust (see Table 1). The scores across the seven raters were averaged for a final rating of the participants' behavior.

Table 1. Intraclass correlation coefficients for raters of disgust behavior for each emotion regulation condition.

Displayed Behavior	Emotion Regulation Condition		
	Watch	Suppress	Amplify
Disgust	.77	.77	.73

Psychophysiological Measures

Electrocardiography (EKG) and skin conductance level (SCL) were recorded using a Mindware impedance cardiograph (MW2000) in conjunction with the Biopac© MP150 device

consisting of an eight-channel polygraph and a microcomputer. All physiological data was collected second-by-second using AcqKnowledge© software to be analyzed using Mindware© software. EKG, which provides a measurement of cardiac activity, was measured through three Biopac pre-gelled, self-adhering, disposable electrodes placed at three places on the torso: the right clavicle at the midclavicular line, just above the last bone of the ribcage at the left midaxillary line, and just below the last bone of the ribcage at the right midaxillary line. From the EKG signals, we derived the interbeat interval (IBI). IBI is calculated as the elapsed time in milliseconds (ms) between heart beats and is the inverse of heart rate. Thus, higher interbeat intervals are indicative of slower heart rate or lower physiological arousal.

SCL, or skin conductance level, provides an index of sweat gland activity at the surface of the skin in microsiemens (μS). This index was measured using two reusable electrodes filled with isotonic recording gel that were placed on the middle phalange of the first and third fingers of the non-dominant hand, and secured with Velcro straps and medical tape. Increased stress responses and an orienting response to new stimuli are indicated by higher levels of SCL.

Physiological Reactivity. In order to prepare the physiological data for analysis, mean reactivity levels were calculated for interbeat interval (IBI) and skin conductance level (SCL) during the 1 minute pre-film baseline and during each film. No transformations were done on these physiological scores.

Physiological Recovery. Because capturing the duration of arousal is considered a more meaningful indicator of recovery (Fredrickson, Mancuso, Branigan, & Tugade, 2000a; Fredrickson et al., 2000b), mean reactivity during the 2 minute post-film period was not calculated. Rather, the length of time (in seconds) for participants' physiological levels to return to the pre-film baseline levels was assessed by first calculating a *baseline confidence interval* for both physiological indices (Fredrickson & Levenson, 1998). This confidence interval was

computed as one standard deviation above and below the participants' means pre-film baseline reactivity. Recovery was considered to have been reached when physiological activity remained within the computed confidence interval for at least 5 of 6 consecutive seconds during the recovery period. Starting from the second after the film clip ended, the time required for physiological levels to achieve recovery is considered the recovery time. Although the recovery period could have been measured for a longer period of time, past work has shown recovery to baseline arousal levels consistently occurs within 2 minutes (Fredrickson, et al., 2000a).

Procedures

Participants arrived at the lab room and gave informed consent. They were informed by the consent form that they would be videotaped during the session. Next, they completed the self-report measures on a computer while the experimenter waited in the control room. Once the participant finished the self-report measures, a same-gender experimenter went to the participant room in order to apply the electrodes. After testing the physiological equipment was receiving proper signals, the experimenter stayed in the control room for the duration of the session, while the participant was seated at the computer.

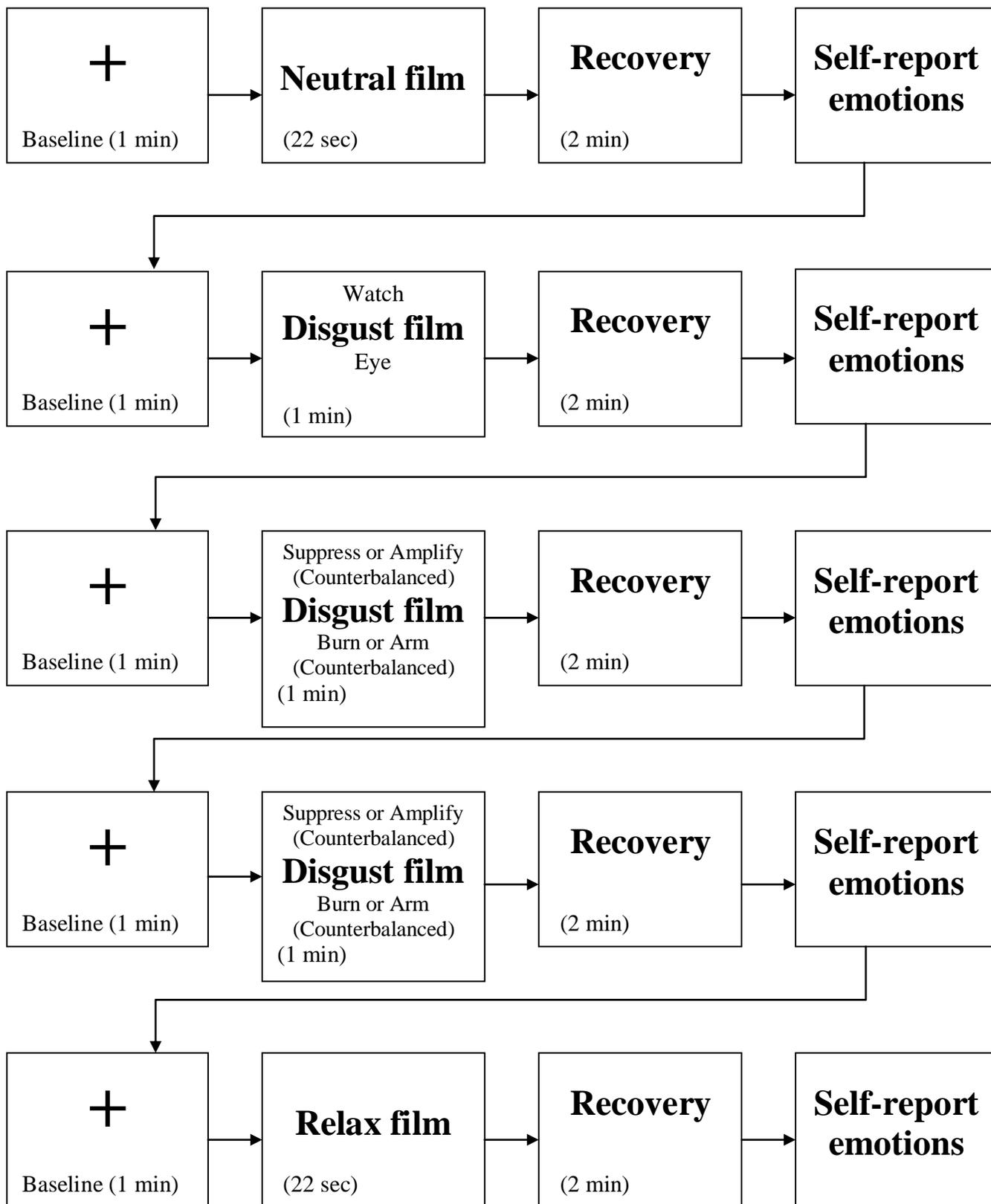
Overall, participants watched a total of five films previously used in emotion regulation research (Gross & Levenson, 1993), which have been standardized for the emotions intended to be elicited and in length of time (see Figure 1 for flowchart of procedures). Before each film, participants were presented with a brief fixation cross followed by directions to clear the mind of "all thoughts, feelings, and memories". The screen remained blank for one minute, serving as the baseline period. Next they read directions to watch the film carefully and, to alert the experimenter, "If you find the film too distressing, just say 'stop'". After each film, the screen remained blank for two minutes, serving as the recovery period, followed by the self-report measure of emotion. Films were approximately 60 seconds with the exception of the first film

lasting 22 seconds.

All participants watched the same films at the beginning and end of the session. Film 1 was a neutral film intended to elicit little emotion and depicted seagulls flying over a beach during which participants' baseline physiological activity was being measured. Film 5 was a relaxation film intended to be positive as it depicts various animals at the beach. After watching this last film, sitting quietly during the recovery period, and completing a final self-rating of emotion, the experimenter went into the lab room to inform the participant that the experiment was over, remove the electrodes, and to go over the debriefing.

Films 2 – 4 were the disgust films and were preceded by additional instructions that manipulated emotion regulation. The first disgust film (Film 2) always depicted an eye operation and was not associated with any specific emotion regulation instructions. The next two films, a burn victim's skin graft and an arm amputation, were presented in a randomized order along with additional emotion regulation directions that were also presented in random order. Thus, the order of presentation for films 3 and 4 were counterbalanced as were the emotion regulation directions preceding films 3 and 4. This resulted in four possible orders: suppression to the burn film, amplification to the arm amputation, suppression to the arm amputation, and amplification to the burn film. The instructions to amplify emotions were (words in parentheses referring to instructions to suppress): "This time, if you have any feelings as you watch the film clip, try your best (not) to let those feelings show. In other words, as you watch the film clip, try to behave in such a way so that a person watching you would (clearly not) know how you were feeling. To summarize, as you watch the film clip, try to show (hide) your feelings as much as you can."

Figure 1. Flowchart of experimental film procedures.



Chapter 3

RESULTS

Before presenting the results of primary hypotheses testing the effects of race and the emotion regulation instructions on the dependent variables of interest, I first discuss the handling of missing data, the calculation of preliminary analyses, and the plan for analyses. Preliminary analyses consisted of checking that the manipulation of emotion regulation worked and calculating the correlation between reactivity and recovery. The analysis plan outlines which statistical analyses were employed and explains the rationale for using MANOVAs. Afterwards, the results of the main hypotheses testing are presented. It should be noted that the MANOVAs included simultaneous testing of hypotheses 1 and 2 together, and 3 and 4 together.

Missing Data

All self-report and behavioral data collected from participants is included in their respective analyses, however, approximately one-third ($n = 32$) of the participants' psychophysiological data was determined to be unusable. Most instances were due to problems such as excessive participant movement leading to artifact error in the physiological signals or experimenter error in properly triggering data collection at the start of the experiment ($N = 21$ out of the 32 dropped). These problems with data collection affected both the Asian American and European American participants ($N = 8$ and 13, respectively).

A small subset of physiological data ($N = 11$ out of 31 dropped) was dropped because these participants asked the experimenters to stop playing a film after the session had already begun. These participants found the film clips too distressing to watch, resulting in physiological data that was drastically shortened relative to other participants. These data were excluded given the ambiguity that would result from comparisons with data from participants who watched films

in their entirety. More Asian American than European American participants requested a film to be stopped ($N = 7$ and 4 , respectively). Of these participants, all European Americans were female and two Asian Americans were male. Thus, the final sample whose physiological data was analyzed consisted of 36 European Americans and 29 Asian Americans (female 54.7%). Responses to the health screener survey showed that no participants needed to be excluded due to excessive substance use or sleep disruption.

Preliminary Analyses

Manipulation Check. In order to gauge the success of the emotion regulation manipulation, which varied in whether participants were asked to simply watch the film clip, amplify their behavioral displays emotion, or hide displays of emotion, the means for coded disgust behavior were analyzed using a repeated measures ANOVA, with film instruction included as a within-subjects variable. This analysis revealed a significant effect of the emotion regulation instructions, $F(2, 168) = 50.19, p < .001$. Pairwise comparisons confirmed that participants were following the directions of the manipulation: the least amount of disgust was displayed in the suppression condition ($M = .36, SD = .71$), an intermediate amount during the watch condition ($M = .86, SD = .96$), and the most disgust in the amplify condition ($M = 1.43, SD = 1.02$).

Correlation between Reactivity and Recovery. As with previous work, a correlational analysis of recovery time with reactivity level during the film was conducted in order to confirm that recovery time was not simply a function of the peak level of reactivity (Fredrickson et al., 2000a; Fredrickson & Levenson, 1998). Specifically, the mean SCL and mean IBI activity during the film was correlated with the SCL and IBI recovery times separately by condition (see Table 2). Consistent with previous work, the correlations were mostly non-significant with the exception of SCL reactivity negatively correlating with SCL recovery time in the suppression

and the amplification conditions. These correlations suggest a faster recovery time actually occurs with higher SCL reactivity (i.e. higher physiological arousal). Thus, these correlation results confirm that a faster recovery is not a function of simply experiencing little change in physiological arousal during the film or vice versa.

Table 2. Correlations among physiological indices of reactivity and recovery for each emotion regulation condition.

Condition	Reactivity during film	<u>Recovery after film</u>	
		IBI	SCL
Watch	IBI	-.03	-.02
	SCL	.19	-.12
Suppress	IBI	-.10	-.20
	SCL	.13	-.40**
Amplify	IBI	-.17	-.02
	SCL	-.10	-.30*

* $p < .05$, ** $p < .01$

Analysis Plan

For testing Hypotheses 1 through 4, a series of 2 (race) x 2 (regulation instructions) repeated measures ANOVAs was used to test for group differences in emotion behavior and self-reported emotions, whereas 2 (race) x 2 (regulation instructions) repeated measures MANOVAs were conducted for the physiological reactivity and recovery indices. For hypotheses regarding suppression, the emotion regulation instructions compared were watch versus suppress and for hypotheses regarding amplification, the emotion regulation instructions compared were watch versus amplify. Gender was included as a covariate and largely showed no effects. Therefore, the results that are reported are from analyses without gender in the model except where one exception is noted.

The repeated measures MANOVAs represented comparisons by race and regulation instructions (suppress versus watch for hypothesis 1 and 2; amplify versus watch for hypothesis

3 and 4) on the absolute values of the physiological indices. MANOVAs allowed for the simultaneous analysis of the physiological measures, which was important to avoid inflating Type 1 error and to maximize power given the lower N for these analyses. Although the magnitude of the correlations among the reactivity levels and recovery times for IBI and SCL did not demonstrate the size typically justifying a MANOVA (see Table 2 for correlations across groups and see Tables 3 and 4 for correlations separated by group), the theoretical connection between these variables as separate indices of physiological arousal did suggest that a MANOVA was appropriate. In order to test Hypothesis 5, a series of regressions were conducted where the dependent variables were regressed on race, ethnic identity (centered variable), and the race x ethnic identity interaction. This set of analyses was tested on the following variables: disgust behavior, physiological reactivity (IBI and SCL) as indicated by mean level of arousal during film presentation, recovery time (IBI and SCL), and self-reported disgust. All moderation analyses were conducted separately by regulation instructions (suppression versus amplification).

Table 3. Correlations for measures of physiological reactivity during film and recovery after film for European Americans in each emotion regulation condition.

Condition		1	2	3	4	5	6	7	8
Suppression	1. Mean IBI	---	-.15	-.11	-.20	.92***	-.17	.30	.40*
	2. Mean SCL		---	.15	-.40*	-.09	.97***	.04	-.39*
	3. IBI Recovery			---	-.22	-.18	.07	.22	-.26
	4. SCL Recovery				---	-.19	-.42*	-.22	.26
Amplification	5. Mean IBI					---	-.12	.34 ^m	.31
	6. Mean SCL						---	-.04	-.40*
	7. IBI Recovery							---	-.11
	8. SCL Recovery								---

^m $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

Table 4. Correlations for measures of physiological reactivity during film and recovery after film for Asian Americans in each emotion regulation condition.

Condition		1	2	3	4	5	6	7	8
Suppression	1. Mean IBI	---	-.01	-.07	-.20	.98***	-.01	-.32	-.23
	2. Mean SCL		---	.26	-.38 ^m	.02	.98***	-.11	-.11
	3. IBI Recovery			---	.27	-.16	.25	.40*	.39 ^m
	4. SCL Recovery				---	-.33	-.33	.25	.24
Amplification	5. Mean IBI					---	.01	-.41*	-.27
	6. Mean SCL						---	-.09	-.05
	7. IBI Recovery							---	.12
	8. SCL Recovery								---

^m $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

Primary Analyses

The primary analyses test the effects of race, emotion regulation instructions condition, and the race x instructions interaction on the dependent measures. Means and standard deviations of all dependent measures by race and instructions condition along with F-test results for the main effect of race are reported in Table 5.

Table 5. Means (Standard deviations) by race and condition and *F* test results for one-way ANOVAs testing effect of race within each condition.

Condition		<u>Race</u>		<i>df</i>	<i>F</i>	<i>p</i>	η^2	Obs. power
		European Americans	Asian Americans					
Watch	Displayed disgust	.93 (1.00)	.71 (.90)	1, 83	1.07	ns	---	---
	Mean IBI	833.23 (105.44)	855.37 (152.30)	1, 44	.34	ns	---	---

	Mean SCL	1.43 (.72)	.82 (.61)	1, 44	9.34	p< .01	.18	.85
	IBI Recovery	28.96 (29.10)	27.67 (23.71)	1, 44	.03	ns	---	---
	SCL recovery	63.48 (46.60)	80.67 (46.01)	1, 44	1.57	ns	---	---
	SR disgust	1.93 (2.37)	2.19 (2.63)	1, 54	.14	ns	---	---
Suppression	Displayed disgust	.39 (.72)	.32 (.70)	1, 83	.17	ns	---	---
	Mean IBI	848.89 (111.19)	827.89 (155.14)	1,44	.29	ns	---	---
	Mean SCL	1.54 (.74)	.83 (.59)	1,44	12.34	p<.01	.22	.93
	IBI Recovery	21.44 (23.26)	29.14 (31.79)	1,44	.90	ns	---	---
	SCL recovery	67.12 (43.44)	76.81 (45.59)	1,44	.54	ns	---	---
	SR disgust	2.59 (2.54)	2.89 (2.68)	1, 54	.19	ns	---	---
Amplification	Displayed disgust	1.71 (1.02)	1.03 (.88)	1,83	10.41	p<.01	.11	.89
	Mean IBI	803.31 (103.27)	812.90 (164.22)	1,46	.06	ns	---	---
	Mean SCL	1.62 (.76)	.91 (.60)	1,46	12.40	p<.001	.21	.93
	IBI Recovery	23.66 (17.81)	26.67 (27.07)	1,46	.21	ns	---	---
	SCL recovery	56.59 (43.17)	77.14 (41.08)	1,46	2.79	p=<.10	.06	.37
	SR disgust	3.07 (2.42)	2.63 (2.69)	1,54	.41	ns	---	---

Note. Recovery time is expressed in seconds and SCL is expressed in microsiemens (μ S)

Emotional Reactivity during Suppression. Asian Americans were predicted to 1) display less disgust, 2) show less physiological reactivity, and 3) report less disgust than European Americans. This group difference would be more pronounced in the suppression condition relative to the watch condition. Group differences in disgust display and self-reported disgust were tested with a 2 (race: Asian American, European American) x 2 (regulation instructions: watch, suppress) repeated measures ANOVA with emotion regulation instructions as a within-subjects variable. Results for display of disgust yielded a significant main effect of instructions, $F(1, 83) = 19.17, p < .001$, as discussed above in the manipulation check. Failing to support hypothesis 1, there was no significant effect of race or the race x instructions interaction. European Americans and Asian Americans showed similar levels of disgust across the watch and suppression conditions. Similarly, analyses of self-reported disgust only showed a main effect of instruction, $F(1, 54) = 7.65, p < .01$, such that participants reported feeling more disgust after the suppression condition ($M = 2.73, SD = 2.59$), compared to the watch condition ($M = 2.05, SD = 2.48$). There was no significant main effect of race nor was there a race by instruction interaction, failing to support hypothesis 1.

In order to test hypotheses 1 and 2, a repeated measures MANOVA was conducted to determine the effect of race and instructions (watch versus suppress) on the physiological reactivity levels and recovery times for the watch and suppression conditions. The following dependent variables were included in the MANOVA: mean IBI and mean SCL during film presentation and IBI and SCL recovery times. Results yielded significant differences were found between European Americans and Asian Americans on the dependent measures, Wilks' $\Delta = .77$, $F(4,41) = 3.10, p < .05$. The multivariate η^2 based on Wilks' Δ was .23 and observed power was .76. Follow-up univariate tests of the between-subject effects indicated that only mean SCL differed by race, such that European Americans experienced higher levels of SCL compared to

Asian Americans, $F(1,44) = 11.38, p < .01$. There was a significant race x instructions interaction in the multivariate results, Wilks' $\Delta = .78, F(4,41) = 2.92, p < .05, \eta^2 = .05$, observed power was .74, however univariate tests failed to show any significance. These findings partially support hypothesis 1 because they indicate that Asian Americans did indeed show less SCL reactivity compared to European Americans in both the watch and suppress conditions, however, the results do not support hypothesis 2 since there were no differences in recovery. Overall, hypotheses 1 and 2 were not supported by the findings for displayed or self-reported disgust or recovery time, but hypothesis 1 was partially supported by the results for physiological arousal during film presentation.

Emotional Reactivity During Amplification. It was expected that European Americans were predicted to 1) display more disgust, 2) show higher physiological reactivity, and 3) report more disgust than Asian Americans in the amplification condition relative to the watch condition. Again, group differences in displayed and self-reported disgust were tested using a 2 (race: Asian American, European American) x 2 (regulation instructions: watch, amplify) repeated measures ANOVA with regulation instructions as a within-subjects variable. As discussed earlier, displayed behavior resulted in a significant main effect of instructions., $F(1, 83) = 35.45, p < .001$. A main effect of race emerged $F(1,83) = 5.65, p < .05, \eta^2 = .06$, observed power = .65 such that European Americans displayed more disgust than the Asian Americans across the watch and amplification conditions, however, this was qualified by a significant race x instructions interaction, $F(1, 83) = 6.25, p < .05, \eta^2 = .07$, observed power = .70. Unpacking this interaction with univariate analyses revealed that European Americans showed more disgust in the amplify condition than Asian Americans, , but there were no group differences in the watch condition (see Table 5). These findings confirm hypothesis 3. In contrast, the analysis of self-reported disgust did not show a significant effect for race, but a significant effect for instructions.

Participants were more likely to report more disgust in the amplification ($M = 2.86, SD = 2.54$) condition compared to the watch condition ($M = 2.05, SD = 2.48$), $F(1,54) = 12.27, p < .001$. The race x instructions interaction was not significant. Thus, the results for displayed disgust confirmed and the results for self-reported disgust failed to confirm hypothesis 3.

Next, another repeated measures MANOVA was conducted to determine the effect of race and instructions (watch versus amplify) on physiological reactivity and recovery times from the watch film to the amplification film. Significant differences were found between European Americans and Asian Americans on the dependent measures, Wilks' $\Delta = .76, F(4,43) = 3.40, p < .05$. The multivariate η^2 based on Wilks' Δ was .24 and observed power was .81. The test of between-subject effects indicated that race was a factor for mean SCL, $F(1,46) = 12.26, p < .001, \eta^2 = .21$, observed power was .93, and SCL recovery time, $F(1,46) = 4.00, p < .05, \eta^2 = .08$, observed power was .50, such that European Americans experienced higher levels of physiological arousal and faster recovery times compared to Asian Americans in response to the amplification condition. The race x instructions interaction was not significant. These findings provide partial support for hypothesis 3 and hypothesis 4. In sum, displayed disgust, but not self reported disgust supported hypothesis 3, Europeans displayed more disgust than the Asian Americans, and the results for physiological reactivity and recovery partially supported hypotheses 3 and 4 because the European Americans showed higher SCL reactivity, and faster SCL recovery than the Asian Americans in the amplify condition.

Ethnic Identity. Ethnic identity was expected to moderate the differences between Asian Americans and European Americans described in Hypotheses 1-4 such that increased in-group identification should lead Asian Americans to display less disgust, show less reactivity, report less disgust, and show faster recovery during the suppression condition relative to less identified in-group members. Similarly, an increased identification with the in-group should lead European

Americans to display more disgust, show more reactivity, report more disgust, and show faster recovery during the amplification condition relative to less identified in-group members.

Although most of the previous analyses showed no group differences, the analyses were conducted to make certain that ethnic identity was not masking any group differences.

For the sake of brevity, only significant main effects of ethnic identity and significant race x ethnic identity interaction effects are reported here. Main effects of race are not reported here as they have already been reported in the analyses above. Regression analyses for all dependent variables failed to show a moderation effect of ethnic identity. The only significant findings for this study were reported for the previous hypotheses. Thus, Hypothesis 5 was not supported.

Chapter 4

DISCUSSION

The current work sought to extend understanding of how emotion regulation strategies relate to different outcomes in a sample of European Americans and Asian Americans using a variety of methods. Based on differences in cultural norms suggesting that suppression is often encouraged in Eastern cultural contexts, but discouraged in Western cultural contexts, it was expected that Asian Americans would show outcomes indicative of cultural congruence when suppressing their emotions (i.e., less displayed and self-reported disgust, lower reactivity, and faster recovery), whereas European Americans were expected to show outcomes indicative of cultural congruence when amplifying their emotions (i.e. more displayed and self-reported disgust, higher reactivity, and faster recovery). In the suppression condition, support for the hypotheses was found when examining physiological indicators of reactivity. In the amplification condition, evidence to support the hypotheses emerged from examining displayed disgust, physiological reactivity, and recovery time.

Emotional Reactivity during Suppression

Evidence in support of hypothesis 1 emerged from the analyses of the psychophysiological measures. Specifically, mean SCL levels differed by ethnic group such that European Americans experienced higher levels of physiological arousal compared to Asian Americans during both the watch and suppress conditions. It was expected that the European Americans should show higher reactivity levels in general compared to Asian Americans as a result of engaging in suppression, an emotion regulation strategy that is not culturally congruent and thus, taxing (hypothesis 1; Markus, et al., 1997) or as a result of engaging in amplification, a culturally congruent regulation strategy that may still heighten reactivity (hypothesis 3). Although it was expected that this group difference would only emerge during the suppress

condition, that this finding generalized across the watch and suppress conditions is still consistent with hypothesis 1. It is possible that Asian Americans were engaging in suppression and that European Americans were expressing freely during the watch condition, which is consistent with the finding that European Americans experienced higher physiological arousal across both of these conditions. Despite differences in physiology, no group differences emerged in the display of disgust behavior in either the watch or suppress conditions. Thus, suppressing displays of emotion to the same degree appears to be associated with different consequences for Asian Americans and European Americans in a manner consistent with our notion of culturally congruent regulation strategies.. Therefore, hypothesis 1 was partially supported.

Analyses of the other dependent measures did not yield significant ethnic group differences and some possible explanations are presented. The lack of differences in the display of disgust behavior was surprising given previous literature documenting that Asian Americans report use of suppression more than European Americans (Gross & John, 2003). One explanation for the similarities between the two groups is that the Asian Americans in this study may have been fairly acculturated to mainstream American culture, and thus familiar enough with European American norms to behave similarly to them (i.e., not suppress as much as perhaps a completely foreign-born sample). In fact, previous work suggests that the emotion regulation tendencies of highly acculturated Asian Americans do not differ significantly from the emotion regulation tendencies of their European American peers (Lee, Perez, Minnick, & Soto, 2010).

Another explanation for lack of differences in displayed disgust has to do with the role of contexts on suppressing emotions. Suppression could be thought of as a skill that anyone could use when necessary. Indeed there are many situations when European Americans likely see

suppression as appropriate (e.g., containing excitement in a library or church). The predictions in the present research were based on general cultural norms that prescribe inclinations towards the use of suppression. Therefore, Asian Americans were predicted to display less disgust than the European Americans because the former group is considered to be more inclined to suppress across more contexts. The experimental situation, however, explicitly instructed participants to suppress. Thus, the European Americans, perceiving the situation as one where suppression is expected, displayed the same reduced amount of disgust as the Asian Americans.

The public vs. private nature of the context is another contextual consideration that may have influenced responses. Originally, it was assumed that the entire session would be experienced as a public context, therefore eliciting the expected normative behaviors of the different groups. However, the experience of privacy may have varied over the course of the session due to differences in the film instructions. Instructions to regulate emotion asked participants to imagine being watched, which may have made salient that the session was videotaped and raised levels of self-consciousness, whereas the instructions to simply watch the film included no such suggestions. Future directions could include a reminder in all conditions that the participant is being videotaped in order to ameliorate the possibility that the watch condition was experienced as a relatively private context compared to when asked to regulate emotion. Consequently, if the watch condition was experienced as a relatively private context, the Asian Americans may have felt free to express their reactions at levels similar to the European Americans, which would explain the lack of group differences in displayed disgust. Such a possibility would be consistent with the results from Ekman and Friesen's classic study (1969) where Japanese participants' displayed more or less disgust depending on the presence or absence of the research assistant.

Another consideration in understanding the suppression findings has to do with the behavior coding employed in this study. Although raters were trained to look for facial elements of disgust (e.g. wrinkled nose, furrowed brow), the fact that all raters were European Americans could have introduced a cultural bias in their judgments. For instance, different cultures impart variability in the nature of how emotions are normatively expressed and interpreted (Elfenbein, Beaupre, Levesque, & Hess, 2007). These “dialects” of communicating emotion are considered a culture’s subtle variant of an otherwise universal emotion expression, which thus has the potential to reduce emotion recognition accuracy. According to Elfenbein and colleagues (2007), these subtle dialects result in nuanced, yet systematic differences in the facial muscles activated to express an emotion (although no differences were found in cross-cultural recognition of disgust). Nevertheless, whether the European American coders were equally accurate in judging European versus Asian American participants’ expressions is an important question and should be considered for future studies.

Similar to the null finding for displayed disgust, there were no differences in self-reported disgust across race. Although it was predicted that Asian Americans would report less disgust than European Americans, the manipulation of emotion regulation explicitly directs participants’ attention to how their emotions are displayed to others, not necessarily to how they actually feel or should feel. If the directions encompassed a message about down-regulating the *experience* of emotion, perhaps participants might have shown more culturally congruent self-report responses. A related issue is that the timing of when participants were asked to report their emotions may have washed out any group differences. Namely, the self-reported measure occurred after the 2 minute recovery period, rather than immediately after the film ended. This was done so that the reports of emotion would not interfere with the recovery process. The tradeoff of this approach is that participants may have reported similar levels of disgust because they have already

recovered. Rather future work should include directions that clarify for the participants that they should report how they felt during the watching of the film.

Despite the lack of differences between European and Asian Americans on self-reported disgust, there was a difference in self-reported disgust for both groups between the suppression and watch conditions. Although all participants were instructed to suppress the *display* of their emotions in the suppression condition, participants reported *experiencing* more disgust in the suppression than the watch condition. These findings are consistent with past work that has demonstrated that suppression is related to an increase in experiencing negative affect (Wenzlaff et al., 2001). Of note, even though Asian Americans may tend to suppress their displayed emotions, this may not function necessarily as a way to change how they were subjectively feeling.

Lastly, the results for recovery time showed no group differences, failing to confirm hypothesis 2, the prediction that Asian Americans would be able to recover more quickly than European Americans after suppressing. This was surprising given past work theorizing that the habitual use of personally and culturally congruent self-regulation strategies should be adaptive (Burns et al., 2007, 2008; Engebretson et al., 1989; Lai & Linden, 1992) and the ability to recover quickly from an emotionally evocative event is adaptive. Ultimately, because a sizeable amount of the physiological data originally collected had to be excluded, a main concern is that it is likely the analyses for physiological arousal and recovery were underpowered.

Emotional Reactivity during Amplification

Hypotheses 3 and 4, which predicted group differences in the experience of amplifying emotions was relatively more supported. European Americans showed significantly more disgust than Asian Americans while watching the disgust film in the amplify condition as indicated by the significant race by instructions interaction. This finding firmly supports

hypothesis 3 concerning the prediction that European Americans would be freer at expressing themselves than Asian Americans. Thus, when a situation explicitly sanctions the amplification of emotion, European Americans were more ready to comply with this instruction, presumably because expression is a culturally congruent emotion regulation strategy (Matsumoto, 1990; Mesquita, 2001).

Unpacking the main effect of race on mean SCL and SCL recovery showed that European Americans experienced higher arousal than Asian Americans, but the European Americans also recovered to pre-film baseline SCL levels faster than the Asian Americans. Hypothesis 3 concerns an interesting dilemma in making predictions about European Americans and their engagement in amplification. Whereas the Cultural Norm Hypothesis (Chentsova-Dutton, et al., 2007, 2010) would lead us to predict that European Americans' engagement in a culturally congruent regulation strategy such as amplification should relate to lowered physiological reactivity, such a prediction is difficult to reconcile knowing that amplifying emotions likely leads to an increase in physiological activity. Indeed the European Americans showed higher SCL reactivity, an up-regulation of emotion, which is consistent with Western norms that endorse high arousal emotions as preferable to low arousal emotions (Tsai, 2007). Additionally, if the European Americans were already engaging in uninhibited expression during the watch condition, it makes sense that this effect of race applies across these two conditions. Moreover, hypothesis 4 was confirmed by results showing European Americans experienced faster SCL recovery times than Asian Americans across the two conditions. This finding is consistent with the idea that being able to enact culturally congruent emotion regulation norms is a sign of health (Chentsova-Dutton, et al, 2007, 2010). In other words, in this case, the norm is associated with the ability to down-regulate one's physiological activity after experiencing an emotionally-charged event. This pattern of higher reactivity and faster recovery mirrors previous

findings on high trait anger-out participants when asked to express and was interpreted as an overall adaptive response (Burns et al., 2008). Thus, the analyses of the physiological measures supported hypotheses 3 and 4.

That there were significant group differences found with SCL, but not IBI may be a reflection of the underlying nervous system processes that affect these physiological indices. As noted earlier, the sympathetic nervous system (SNS) is responsible for the flight-or-fight response activated during stressful situations, such as those created in the experimental session. Conversely, the parasympathetic nervous system (PNS) is more active during times of rest. SCL and IBI operate as a function of the SNS, however, IBI is also in large part, a function of the PNS. The relationship between PNS activity and emotion regulation was not considered in this research, but future work that does take PNS activation into account may yield findings that include significant group differences in IBI.

The analyses for the self reported disgust yielded no significant differences across group, contrary to predictions. European Americans were expected to report more disgust compared to Asian Americans because of Western cultural norms that allow for independent self-expressions (Markus & Kitayama, 1991; Tsai, 2007). In the amplify condition, the emotion regulation instructions for displaying emotional reactions could be interpreted as asking participants to express themselves openly in any way possible, including via the self-reporting of emotions. This is supported by the significant main effect of regulation instructions where participants were more likely to report disgust in the amplify condition than the watch condition. Applying the work by Pennebaker and colleagues that demonstrates how expressing personal emotions through writing is a beneficial way to regulate negative affect (Pennebaker & Francis, 1996; Petrie et al., 1998), one might see how the self-reporting of emotions could be similarly cathartic and adaptive. The past work on facial feedback, however, may help explain the difference found

across the different regulation instructions. Participants were asked to let their disgust show, which in turn may have amplified their judgments of how much disgust they were experiencing (Levenson, Ekman, & Friesen, 1990). Nevertheless, the expected group differences were not found.

That there were more results found in the amplification condition versus the data collected from the suppression condition is something worth noting. As mentioned before, it is possible that the expected group differences did not emerge so much in the suppress condition because the Asian American sample may have been at least fairly acculturated to mainstream Western culture already. It is possible that a very conservative test of group differences was subsequently created. Perhaps the group difference for displayed emotion found in the amplification condition is an indication, however, that the Asian American sample was not so highly acculturated as to readily express their emotions above and beyond a certain comfort zone comparable to the European Americans.

Ethnic Identity

Finally, the analyses for hypothesis 5 revealed no significant race x ethnic identity interactions. Again with a more diverse Asian American sample (i.e., including participants who are foreign-born) varying more widely on ethnic identity, we might have found the expected moderation effects. Additionally, the European Americans may have shown the expected effects of ethnic identity if we were to ask them to report their identification with being American rather than being White. Nevertheless, it is assumed that these analyses were underpowered resulting in the null findings. Because ethnic identity has been found to be beneficial for the self and well-being (Crocker, Luhtanen, Blaine, & Broadnax, 1994; Phinney, Cantu, & Kurtz, 1997), we could expect in future studies that main effects of ethnic identity should relate to positive physiological indicators such as decreased reactivity or faster recovery from a stressful event. Such studies

would benefit from taking into consideration the type of stress that ethnic identity is expected to buffer negative effects from since some studies have found that ethnic identity can also increase people's vulnerability to certain types of stress (Chen, LePhuoc, Guzman, Rude, & Dodd, 2006).

Limitations and Future Directions

A serious consideration regarding the lack of significant findings is that the sample was ultimately underpowered. Although an a priori power analysis indicated that the initial sample size was adequate for testing the proposed hypotheses, the excluded participant data compromised the power. Thus, estimates of effect size provided in this study may be more informative than actual tests of significance. Future studies can avoid this problem by recruiting a larger sample of participants. Oversampling can help protect against the inevitable loss of data in physiological studies, but might also allow a comparison of participants who ask to stop a film in this particular protocol. Because of the low number of participants who stopped the film in this study, analyses could not be run to assess any possible differences in the dependent measures between those who did or did not watch all of the films. Therefore, we do not have any definite reassurance that this participant attrition was random rather than systematically associated with some factor. Aside from recruiting a large enough sample, the demographics of the sample also should be taken into account. The sample of Asian American participants may not have been culturally diverse enough to account for such factors as acculturation level or birth country. With a larger or more diverse sample, the ability to tease apart within group variability would be an improvement on the present study.

As mentioned earlier, another limitation that future studies could readily improve upon would be the procedures for how emotional behavior display was measured. Given that Asian cultural norms call for the suppression of expressed and experienced affect (Matsumoto, 1990; Tsai, 2007), the Asian American participants may have been expressing their disgust at levels

that are hard for European American raters to detect. . Nevertheless, the raters were capturing differences in displayed emotions between different emotion regulation conditions. Procedures for more nuanced, meticulous rating of emotion displays do exist and should be employed in future studies (see The Facial Action Coding System [FACS], Ekman & Friesen, 1978)

Lastly, although the focus of this research is on ethnocultural differences in the endorsement of suppression, norms for gender and emotion are also worth exploring especially in tandem with work examining norms of racial/ethnic groups. The emotion regulation literature tends to either discuss race/ethnicity/culture or gender, but not the intersection of race and gender, which poses a fruitful area of future work. Although we did not find gender to be a significant factor in the present work, such investigations may be important for research on other cultures' norms for emotion. For example, investigation of the effect of possessing multiple identities and endorsing multiple norms for emotion would allow researchers to perform more stringent tests of the viability of the Cultural Norm Hypothesis. For example, the Cultural Norm Hypothesis would predict that Asian American women should benefit more from the use of suppression compared to European American women because both Asian cultural norms and gender roles for women proscribe using suppression under certain circumstances. The case for European American women and Asian American men is not as well understood since these populations must contend with the experience of conflicting norm socialization. Perhaps for these populations, whether suppressing emotion necessarily leads to negative outcomes could depend on a variety of moderators such as the presence or absence of witnesses, the gender and race of those witnesses, or the valence of the emotion being suppressed, and not least of which, the level of identification with their race and gender identities.

Conclusion

The current work demonstrates the complexity involved with investigations of emotion regulation, cultural norms, and health outcomes. Although any given emotion regulation strategy may be considered normative and adaptive to a particular group, how those benefits are manifested may be equally diverse, which was why it was important and beneficial to employ a mixed methods approach to capturing the effects of emotion regulation. There was some support for the predictions regarding suppression's benefits for Asian Americans in a group difference in physiological reactivity, and there was evidence that expression may aid in physiological recovery for European Americans. Physiological recovery from an emotionally evocative event is an area of research that is incompletely understood, yet a natural outcome to examine given theories of emotion regulation that describe consequences after regulating emotions. Theories regarding the consequences of emotion regulation strategies would not only be enhanced by accounting for the diversity of cultural norms for emotion, but also by considering multiple outcomes related to the enactment of emotion regulation strategies.

Footnotes

1) This definition is consistent with most expression research where expression typically refers to measures of self-disclosure or emotion display, however, expression can also include the feeling of an emotion.

References

- Bjorklund, D. F., & Kipp, K. (1996). Parental investment theory and gender differences in evolution of inhibition mechanisms. *Psychological Bulletin*, *2*, 163-188.
- Blascovich, J., & Katkin, E. S. (Eds.). (1993). *Cardiovascular reactivity to psychological stress and disease*. APA Volumes. Washington, DC: American Psychological Association.
- Breuer, J., & Freud, S. (1957). *Studies on hysteria*. Oxford, England: Basic Books.
- Brosschot, J. F., Van Dijk, D., & Thayer, J. F. (2007). Daily worry is related to low heart rate variability during waking and the subsequent nocturnal sleep period. *International Journal of Psychophysiology*, *63*, 39-47.
- Burns, J. W., Holly, A., Quartana, P., Wolff, Gray, E., & Bruehl, S. (2008). Trait anger management style moderates effects of actual (“state”) anger regulation on symptom-specific reactivity and recovery among chronic low back pain patients. *Psychosomatic Medicine*, *70*, 898-905.
- Burns, J. W., Quartana, P. J., & Bruehl, S. (2007). Anger management style moderates effects of emotion suppression during initial stress on pain and cardiovascular responses during subsequent pain-induction. *Annals of Behavioral Medicine*, *34*, 154-165.
- Butler, E. A., Egloff, B., Wilhelm, F. H., Smith, N. C., Erikson, E. A., & Gross, J. J. (2003). The social consequences of expressive suppression. *Emotion*, *3*, 48–67.
- Butler, E. A., Lee, T. L., & Gross, J. J. (2007). Emotion regulation and culture: Are social consequences of emotion suppression culture-specific? *Emotion*, *7*, 30–48.
- Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology*, *56*, 267–283.

- Chang, E. C. (2001). A look at the coping strategies and styles of Asian Americans: Similar and different. In C. R. Snyder (Ed.), *Coping with stress: Effective people and processes*. (pp. 222-239). New York, NY, USA: Oxford University Press.
- Chen, G. A., LePhuoc, P., Guzman, M. R., Rude, S. S., & Dodd, B. G. (2006). Exploring Asian American racial identity. *Cultural Diversity and Ethnic Minority Psychology, 12*, 461-476.
- Chentsova-Dutton, Y. E., Chu, J. P., Tsai, J. L., Rottenberg, J., Gross, J. J., & Gotlib, I. H. (2007). Depression and emotional reactivity: Variation among Asian Americans of East Asian descent and European Americans. *Journal of Abnormal Psychology, 116*, 776-785.
- Chentsova-Dutton, Y. E., Tsai, J. L., & Gotlib, I. H. (2010). Further evidence for the cultural norm hypothesis: Positive emotion in depressed and control European American and Asian American women. *Cultural Diversity and Ethnic Minority Psychology, 16*, 284-295.
- Chida, Y., & Hamer, M. (2008). Chronic psychosocial factors and acute physiological responses to laboratory-induced stress in healthy populations: A quantitative review of 30 years of investigations. *Psychological Bulletin, 134*, 829-885.
- Cioffi, D., & Holloway, J. (1993). Delayed costs of suppressed pain. *Journal of Personality and Social Psychology, 64*, 274-282.
- Consedine, N. S., Magai, C., & Bonanno, G. A. (2002). Moderators of the emotion inhibition–health relationship: A review and research agenda. *Review of General Psychology, 6*, 204–228.
- Crocker, J., Luhtanen, R., Blaine, B., & Broadnax, S. (1994). Collective self-esteem and psychological well-being among White, Black, and Asian college students. *Personality and Social Psychology Bulletin, 20*, 503-513.

- Demaree, H. A., Schmeichel, B. J., Robinson, J. L., Pu, J., Everhart, D. E., Berntson, G. G. (2006). Up- and down-regulating facial disgust: Affective, vagal, sympathetic, and respiratory consequences. *Biological Psychology, 71*, 90-99.
- Dorr, N., Brosschot, J. F., Sollers, J. J., & Thayer, J. F. (2007). Damned if you do, damned if you don't: The differential effect of expression and inhibition of anger on cardiovascular recovery in Black and White males. *International Journal of Psychophysiology, 66*, 125-134.
- Ekman, P., & Friesen, W. V. (1969). Nonverbal leakage and clues to deception. *Psychiatry: Journal for the Study of Interpersonal Processes, 32*, 88-106.
- Ekman, P., & Friesen, W. V. (1978). *Facial action coding system: A technique for the measurement of facial movement*. Palo Alto, CA: Consulting Psychologists Press.
- Ekman, P., Friesen, W. V., & Ancoli, S. (1980). Facial signs of emotional experience. *Journal of Personality and Social Psychology, 39*, 1125-1134.
- Elfenbein, H. A., Beaupre, M., Levesque, M., & Hess, U. (2007). Toward a dialect theory: Cultural differences in the expression and recognition of posed facial expressions. *Emotion, 7*, 131-146.
- Engelbreton, T. O., Matthews, K. A., & Scheier, M. F. (1989). Relations between anger expression and cardiovascular reactivity: Reconciling inconsistent findings through a matching hypothesis. *Journal of Personality and Social Psychology, 57*, 513-521.
- Esterling, B. A., Antoni, M. H., Fletcher, M. A., Margulies, S., & Schneiderman, N. (1994). Emotional disclosure through writing or speaking modulates latent Epstein-Barr virus antibody titers. *Journal of Consulting and Clinical Psychology, 62*, 130-140.
- Fredrickson, B. L., & Levenson, R. W. (1998). Positive emotions speed recovery from the cardiovascular sequelae of negative emotions. *Cognition and Emotion, 12*, 191-220.

- Fredrickson, B. L., Mancuso, R. A., Branigan, C., & Tugade, M. M. (2000a). The undoing effect of positive emotions. *Motivation and Emotion, 24*, 237-258.
- Fredrickson, B. L., Maynard, K. E., Helms, M. J., Haney, T. L., Siegler, I. C., & Barefoot, J. C. (2000b). Hostility predicts magnitude and duration of blood pressure response to anger. *Journal of Behavioral Medicine, 23*, 229-243.
- Garssen, B., & Goodkin, K. (1999). On the role of immunological factors as mediators between psychosocial factors and cancer progression. *Psychiatry Research, 85*, 51-61.
- Gross, J. J. (1998). Antecedent- and response-focused emotion regulation: Divergent consequences for experience, expression, and physiology. *Journal of Personality and Social Psychology, 74*, 1464-1480.
- Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology, 85*, 348-362.
- Gross, J. J., & Levenson, R. W. (1993). Emotional suppression: Physiology, self-report, and expressive behavior. *Journal of Personality and Social Psychology, 64*, 970-986.
- Gross, J. J., & Muñoz, R. F. (1995). Emotion regulation and mental health. *Clinical Psychology: Science and Practice, 2*, 151-164.
- Gudykunst, W. B., Matsumoto, Y., Ting-Toomey, S., & Nishida, T. (1996). The influence of cultural individualism-collectivism, self-construals, and individual values on communication styles across cultures. *Human Communication Research, 22*, 510-543.
- Hamer, M., & Malan, L. (2010). Psychophysiological risk markers of cardiovascular disease. *Neuroscience and Biobehavioral Reviews, 35*, 76-83.

- Harburg, E., Blakelock, E. H., & Roeper, P. J. (1979). Resentful and reflective coping with arbitrary authority and blood pressure: Detroit. *Psychosomatic Medicine*, *41*, 189-202.
- Haynes, S. N., Gannon, L. R., Orimoto, L., O'Brien, W. H., & Brandt, M. (1991). Psychophysiological assessment of poststress recovery. *Psychological Assessment*, *3*, 356-365.
- Heponiemi, T., Elovainio, M., Pulkki, L., Puttonen, S., Raitakari, O., & Keltikangas-Jarvinen, L. (2007). Cardiac autonomic reactivity and recovery in predicting carotid atherosclerosis: The cardiovascular risk in young Finns study. *Health Psychology*, *26*, 13-21.
- Hofstede, G. (1983). National cultures revisited. *Behavioral Science Research*, *18*, 285-305.
- Hokanson, J. E., Willers, K. R., & Koropsak, E. (2006). The modification of autonomic responses during aggressive interchange. *Journal of Personality*, *36*, 403-404.
- John, O. P., & Gross, J. J. (2004). Healthy and unhealthy emotion regulation: Personality processes, individual differences, and lifespan development. *Journal of Personality*, *72*, 1301-1334.
- Jorgensen, R. S., Johnson, B. T., Kolodziej, M. E., & Schreer, G. E. (1996). Elevated blood pressure and personality: A meta-analytic review. *Psychological Bulletin*, *120*, 293-320.
- Kim, H. S. (2008). Culture and the cognitive and neuroendocrine responses to speech. *Journal of Personality and Social Psychology*, *94*, 32-47.
- Kim, H. S., Sherman, D. K., & Taylor, S. E. (2008). Culture and social support. *American Psychologist*, *63*, 518-526.
- Kitayama, S., Markus, H. R., & Kurokawa, M. (2000). Culture, emotion, and well-being: Good feelings in Japan and the United States. *Cognition and Emotion*, *14*, 93-124.

- Krantz, D. S., & Manuck, S. B. (1984). Acute psychophysiological reactivity and risk of cardiovascular disease: A review and methodological critique. *Psychological Bulletin*, *96*, 435-464.
- Krieger, N. (1990). Racial and gender discrimination: risk factors for high blood pressure. *Social Science & Medicine*, *30*, 1273-1281.
- Lai, J. Y., & Linden, W. (1992). Gender, anger expression preferences, and opportunity for anger release determine cardiovascular recovery from anger provocation. *Psychosomatic Medicine*, *54*, 297-310.
- Lam, A. G., & Zane, N. W. S. (2004). Ethnic differences in coping with interpersonal stressors: A test of self-construals as cultural mediators. *Journal of Cross-Cultural Psychology*, *35*, 446-459.
- Lazarus, R. S. (1993). Coping theory and research: Past, present, and future. *Psychosomatic Medicine*, *55*, 234-247.
- Lee, E. A., Perez, C. R., Minnick, M. R., & Soto, J. A. (2010, January). *Health consequences of emotion regulation on different cultural populations: A comparison of Asian and European Americans*. Poster session presented at the 11th annual meeting of the Society for Personality and Social Psychology, Las Vegas, NV.
- Levenson, R. W., Ekman, P., & Friesen, W. V. (1990). Voluntary facial action generates emotion-specific autonomic nervous system activity. *Psychophysiology*, *27*, 363-384.
- Levenson, R. W., Soto, J., & Pole, N. (2007). Emotion, biology, and culture. In S. Kitayama & D. Cohen (Eds.), *Handbook of Cultural Psychology* (pp.780-796). New York: Guilford.

- Linden, W., Earle, L., Gerin, W., & Christenfeld, N. (1997). Physiological stress reactivity and recovery: Conceptual siblings separated at birth? *Journal of Psychosomatic Research, 42*, 117-135.
- Luhtanen, R., & Crocker, J. (1992). A collective self-esteem scale: Self-evaluation of one's social identity. *Personality and Social Psychology Bulletin, 18*, 302-318.
- MacDougall, J. M., Dembroski, T. M., Dimsdale, J. E., & Thomas, P. (1985). Components of Type A, hostility, and anger-in: Further relationships to angiographic findings. *Health Psychology, 4*, 127-152.
- Manuck, S. B., Kamarak, T. W., Kasprovicz, A. S., & Waldstein, S. R. (1993). Stability and patterning of behaviorally evoked cardiovascular reactivity. In J. J. Blascovich & E. S. Katkin (Eds.), *Cardiovascular reactivity to psychological stress & disease. APA science volumes* (pp. 111-134). Washington, DC: American Psychological Association.
- Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review, 98*, 224-253.
- Markus, H. R., Mullally, P. R., & Kitayama, S. (1997). Selfways: Diversity in modes of cultural participation. In U. Neisser & D. A., Jopling (Eds.), *The conceptual self in context: Culture, experience, self-understanding. The Emory symposia in cognition* (pp. 12-61). New York: Cambridge University Press.
- Matsumoto, D. (1990). Cultural similarities and differences in display rules. *Motivation and Emotion, 14*, 195-214.
- Matsumoto, D., Yoo, S. H., & Nakagawa, S. (2008). Culture, emotion regulation, and adjustment. *Journal of Personality and Social Psychology, 94*, 925-937.

- Mauss, I. B., & Butler, E. A. (2009). Cultural context moderates the relationship between emotion control values and cardiovascular challenge versus threat responses. *Biological Psychology, 84*, 521-530.
- Mauss, I. B., & Gross, J. J. (2004). Emotion suppression and cardiovascular disease: Is hiding feelings bad for your heart? In L. R. Temoshok, I. Nyklicek, & A. Vingerhoets (Eds.), *Emotional expression and health: Advances in theory, assessment and clinical applications* (pp. 62-81). New York: Brunner-Routledge.
- Mensah, G. A., & Dunbar, S. B. (2006). A framework for addressing disparities in cardiovascular health. *Journal of Cardiovascular Nursing, 21*, 451-456.
- Mesquita, B. (2001). Emotions in collectivist and individualist contexts. *Journal of Personality and Social Research, 80*, 68-74.
- Mesquita, B., & Frijda, N. H. (1992). Cultural variations in emotions: A review. *Psychological Bulletin, 112*, 179-204.
- Noh, S., Beiser, M., Kaspar, V., Hou, F., & Rummens, A. (1999). Perceived racial discrimination, depression, and coping: A study of Southeast Asian refugees in Canada. *Journal of Health and Social Behavior, 40*, 193-207.
- Pennebaker, J. W., & Beall, S. K. (1986). Confronting a traumatic event: Toward an understanding of inhibition and disease. *Journal of Abnormal Psychology, 95*, 274-281.
- Pennebaker, J. W., & Francis, M. E. (1996). Cognitive, emotional, and language processes in disclosure. *Cognition and Emotion, 10*, 601-626.
- Pennebaker, J. W., & Seagal, J. D. (1999). Forming a story: The health benefits of narrative. *Journal of Clinical Psychology, 55*, 1243-1254.

- Perez, C. R., & Soto, J. A.* (2011). Cognitive reappraisal in the context of oppression: Implications for psychological functioning. *Emotion, 11*, 675-680. [*First authorship shared]
- Petrie, K. J., Booth, R. J., & Pennebaker, J. W. (1998). The immunological effects of thought suppression. *Journal of Personality and Social Psychology, 75*, 1264-1272.
- Pieper, W., & Brosschot, J. F. (2005). Prolonged stress-related cardiovascular activation: Is there any. *Annals of Behavioral Medicine, 30*, 91-103.
- Phinney, J. S., Cantu, C. L., & Kurtz, D. A. (1997) Ethnic and American identity as predictors of self-esteem among African American, Latino, and white adolescents. *Journal of Youth and Adolescence, 26*, 165-185.
- Polivy, J. (1998). The effects of behavioral inhibition: Integrating internal cues, cognition, behavior and affect. *Psychological Inquiry, 9*, 181-204.
- Richards, J. M., & Gross, J. J. (2000). Emotion regulation and memory: The cognitive costs of keeping one's cool. *Journal of Personality and Social Psychology, 79*, 410-424.
- Schutte, N. S., Manes, R. R., & Malouff, J. M. (2009). Antecedent-focused emotion regulation, response modulation, and well-being. *Current Psychology: A Journal for Diverse Perspectives on Diverse Psychological Issues, 28*, 21-31.
- Shweder, R. A., Haidt, J., Horton, R., & Joseph, C. (2008). The cultural psychology of the emotions: Ancient and renewed. In M. Lewis, J. M. Haviland-Jones, & L. Feldman Barrett (Eds.), *Handbook of emotions* (3rd. ed.; pp. 409-427). New York: Guilford.
- Soto, J. A., Levenson, R. W., & Ebling, R. (2005). Cultures of moderation and expression: Emotional experience, behavior, and physiology in Chinese Americans and Mexican Americans. *Emotion, 5*, 154-165.
- Soto, J. A., Perez, C. R., Kim, Y. -H., Lee, E. A., & Minnick, M. R. (in press). Is expressive

- suppression always associated with poorer psychological functioning? A cross-cultural comparison between European Americans and Hong Kong Chinese. *Emotion*.
- Spera, S. P., Buhrfeind, E. D., & Pennebaker, J. W. (1994). Expressive writing and coping with job loss. *Academy of Management Journal*, *37*, 722-733.
- Strack, F., Martin, L. L., & Stepper, S. (1988). Inhibiting and facilitating conditions of the human smile: A non-obtrusive test of the facial feedback hypothesis. *Journal of Personality and Social Psychology*, *54*, 768-777.
- Suchday, S., & Larkin, K. T. (2004). Psychophysiological responses to anger provocation among Asian Indian and White men. *International Journal of Behavioral Medicine*, *11*, 71-80.
- Suls, J., Wan, C. K., & Costa, P. T. (1995). Relationship of trait anger to resting blood pressure: A meta-analysis. *Health Psychology*, *14*, 444-456.
- Ting-Toomey, S., Yee-Jung, K. K., Shapiro, R. B., Garcia, W., Wright, T. J., & Oetzel, J. G. (2000). Ethnic/cultural identity salience and conflict styles in four US ethnic groups. *International Journal of Intercultural Relations*, *24*, 47-81.
- Triandis, H. C. (1993). Collectivism and individualism as cultural syndromes. *Cross-Cultural Research: The Journal of Comparative Social Science*, *27*, 155-180.
- Tsai, J. L. (2007). Ideal affect: Cultural causes and behavioral consequences. *Perspectives on Psychological Science*, *2*, 242-259.
- Tsai, J. L., Miao, F. F., Seppala, E., Fung, H. H., & Yeung, D. Y. (2007). Influence and adjustment goals: Sources of cultural differences in ideal affect. *Journal of Personality and Social Psychology*, *92*, 1102-1117.

- Tsai, J. L., Chentsova-Dutton, Y., Freire-Bebeau, L., & Przymus, D. E. (2002). Emotional expression and physiology in European Americans and Hmong Americans. *Emotion, 2*, 380-397.
- Wenzlaff, R. M., Rude, S. S., Taylor, C. J., Stultz, C. H., & Sweatt, R. A. (2001). Beneath the veil of thought suppression: Attentional bias and depression risk. *Cognition and Emotion, 15*, 435-452.
- Williams, R. B., Haney, T. L., Lee, K. L., Kong, Y. H., Blumenthal, J. A., & Whalen, R. E. (1980). Type A behavior, hostility, and coronary atherosclerosis. *Psychosomatic Medicine, 42*, 539-549.

Appendix A

Health Screener

Subject #: _____

Date: _____

Time: _____

	Amount consumed today	Is this typical for the past month?	What time today was your most recent one?
1. Coffee/cola (do not include decaffeinated)	_____	_____	_____
2. Tea (do not include decaf or herbal teas)	_____	_____	_____
3. Cigarettes	_____	_____	_____
4. Alcohol (beer, wine, mixed drinks, hard cider)	_____	_____	_____
5. Over-the-counter medications (aspirin, Tylenol, cough syrup, decongestants, etc.)	_____	_____	_____
6. Prescription medications	_____	_____	_____
Name of prescription(s): _____			
7. Any other substances that might affect physiological functioning (e.g., heart rate, sweating, breathing)?	_____	_____	_____
8. How many hours of sleep did you get last night?	_____		
Did you take any naps today?	_____yes _____no (please check one)		
If yes, for how many minutes/hours?	_____		
How many hours of sleep did you get the night before last?	_____		

Appendix B

Ethnic Identity**Collective Self Esteem – race/ethnicity version – Importance to Identity Subscale**

INSTRUCTIONS: We are all members of different social groups or social categories. Some of such social groups or categories pertain to gender, race, religion, nationality, ethnicity, and socioeconomic class. We would like you to consider your memberships in those particular groups or categories, and respond to the following statements on the basis of how you feel about those groups and your memberships in them. There are no right or wrong answers to any of these statements; we are interested in your honest reactions and opinions. Please read each statement carefully, and respond by using the following scale from 1 to 7:

	Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Strongly Agree
Overall, my race/ethnicity has very little to do with how I feel about myself.	1	2	3	4	5	6	7
The racial/ethnic group I belong to is an important reflection of who I am.	1	2	3	4	5	6	7
My race/ethnicity is unimportant to my sense of what kind of a person I am.	1	2	3	4	5	6	7
In general, belonging to my race/ethnicity is an important part of my self image.	1	2	3	4	5	6	7

Scoring for the Importance to Identity subscale:

First, reverse-score answers to items 1 and 3, such that (1 = 7), (2 = 6), (3 = 5), (4 = 4), (5 = 3), (6 = 2), (7 = 1).

Then sum the answers to the four items for each respective subscale score, and divide each by 4.

Appendix C

Ratings of Emotion Before and After Films

1) Use the following scale from 0 to 3 to rate the participant's display of various emotions.

0 = not at all	1 = low	2 = medium	3 = high
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How much did the participant display:

Fear
 Surprise/Shock
 Disgust
 Positivity
 Negativity

2) Is there anything about the video that makes you think we should not include in the analysis?
 (open-ended response)

3) Use the following scale from 0 to 8 to rate your impression of the participant.

0 = none	1	2	3	4	5	6	7	8 = very much
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Did the participant seem:

Engaged
 Annoyed
 Physically Uncomfortable

VITA

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- Pennsylvania State University**, University Park, PA
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 - M.S. Social Psychology 2008
- Drew University**, Madison, NJ
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PUBLICATIONS

- Soto, J. A., Perez, C. R., Kim, Y. -H., Lee, E. A., & Minnick, M. R. (in press). Is expressive suppression always associated with poorer psychological functioning? A cross-cultural comparison between European Americans and Hong Kong Chinese. *Emotion*.
- Swim J. K., Becker, J., Lee, E. A., & Pruitt, E R. (2008). Sexism reloaded: Worldwide evidence for its endorsement, expression, and emergence in multiple contexts. In H. Landrine & N. Russo (Eds.), *Bringing diversity to feminist psychology*. New York: Springer Publishing Company.

LEADERSHIP EXPERIENCE

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