

The Effects of Culture and Forgiveness in the Recall  
and Imagery of an Offense

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### Abstract

The current literature states that being forgiving does not lead to the risky health consequences that may be produced when one is unforgiving (Witvliet, Ludwig, & VanderLann., 2001).

Despite cultural differences, levels of forgiveness seem to be similar across cultures. Emotion plays an important role during an offense and forgiveness. Research indicates that those from collectivistic cultures experience more physiological arousal during emotion expression. On the contrary, individuals from individualistic cultures do not experience such physiological arousal during emotion expression (Butler, Lee, & Gross, 2009). In this study, 40 participants from different cultural backgrounds were interviewed about an offense they experienced. The interview included a recall condition and a thinking condition. Heart rate, skin conductance, skin temperature and EMG were continuously recorded during the interview. This study investigated whether participants from collectivistic cultures would have increased physiological arousal during the recall of the offense while those from individualistic cultures would have increased physiological arousal while imagining the offense. It was found that those from collectivistic cultures experienced a significantly lesser increase in EMG during the thinking condition, compared to those from individualistic cultures. This indicates that those from collectivistic cultures frowned less than those from individualistic cultures while imagining the offense. Some physiological means were in the predicted direction. Confounding variables and the order of the conditions seemed to affect the results in the current study. This study demonstrates how our culture influences how we respond when discussing or thinking about an offense we have experienced.

## **Introduction**

During the last decade, forgiveness has received much attention in the psychology field (McCullough, Rachal, Sandage, Worthington, Brown, & Hight, 1998 as cited in Worthington & Scherer, 2004). By studying forgiveness, one can study the strong connection between the body and mind. One can also study how cultures differentiate in forgiveness. Thus, the topic of forgiveness allows researchers to study various areas. The current study adds to the literature by investigating how culture influences forgiveness, emotion expression, and physiological responses.

## **Forgiveness and Culture**

Forgiveness is important if one wants to continue a relationship with others. However, relationships with others can develop and be approached differently in different contexts, for example, cultures. There are two broad types of cultures, individualistic and collectivistic. In individualistic cultures, there is an emphasis on independence from groups, a “lack of attention to the views of others, relatively little concern for family and relatives, and tendencies toward competition” (Triandis, McCusker, & Hui., 1990 as cited in Shkodriani & Gibbons, 1995, p. 766). In contrast, collectivistic cultures view the self as part of a group and value interdependence. Forgiveness is carried out by a victim in both individualist and collectivist cultures, but, forgiveness is given for different reasons. In collectivistic cultures, forgiveness might be expected, such as a “social duty” (Paz, Neto, & Mullet, 2008, p. 150), due to the emphasis on relationships. In individualistic cultures, forgiveness is granted once the victim makes an independent, conscious decision to forgive the other. It is evident that granting forgiveness is greatly influenced by one’s culture.

## **Comparison of forgiveness among cultures.**

Despite the differences among individualistic and collectivistic cultures, levels of forgiveness have been found to be similar between collectivist and individualist cultures; however, different factors are impacted by cultural differences. In a study done by Paz, Neto and Mullet (2008), 1,576 Chinese and French participants completed 18 items from the Forgiveness Questionnaire. Statistical tests showed that Chinese had higher levels of Lasting Resentment and Sensitivity to Circumstances. These findings were due to the Chinese collectivist culture. This study indicates that those from a collectivist culture are affected by different factors during an offense, such as resentment, which can be less important for those from individualistic cultures. Another important finding was the similar level of dispositional forgiveness between the Chinese and French. However, acquiescence effects were present in this finding. Chinese participants were more forgiving than the French when the items on the questionnaire were positive, but were more unforgiving when the items were negative, possibly leading the findings to cancel each other. Concluding that both cultures had similar levels of dispositional forgiveness can be incorrect due to the acquiescence effects; however, other studies have also found similar levels of forgiveness among cultures.

Suchday, Friedberg and Almeida (2006) also found that levels of forgiveness were similar between two cultures and countries, India and the United States. Most participants were university students; 188 from India and 71 from the US. All participants completed six questions related to their tendency to forgive and their tendency to ruminate. Stress and physical symptoms were also measured with a questionnaire. The study found a negative correlation between forgiveness and rumination, as well as perceived stress. This finding is supported by research that has shown that unforgiveness is stressful, indicating that those who are stressed or ruminate often are exposed to health risks (Worthington, & Scherer, 2004). Another interesting

finding was that forgiveness did not predict or correlate with physical symptoms. A reason for this finding could be that participants were too young to report any significant health problems. Perhaps using an older sample could produce a correlation between forgiveness and physical health. Suchday and associates (2006) found that there was no difference between the Indian and US sample in forgiveness, rumination and perceived stress, indicating that cultural differences do not affect forgiveness and health.

One questions whether acquiescence effects arose in these studies (Paz et al., 2008; Suchday et al., 2006) of culture and forgiveness because participants from collectivistic cultures might have felt more compelled to respond in a way that did not go against their cultural beliefs and norms, thus, not giving true responses. There could also be unknown variables, causing these drastic differences between studies, for example, age. Participants who are from an older cohort may have been more impacted by their culture's norms and beliefs because of a minimal North American influence. Today, many cultures are exposed to a higher American cultural influence.

Through the current literature, it is clear that culture does not impact how forgiving one may be. However, culture does seem to impact the reasons why people forgive. Because the current study is investigating cross-cultural differences, levels of forgiveness would not indicate cultural differences since forgiveness levels are similar across various cultures. Thus, one must consider other manners in which forgiveness is affected by cross-cultural differences.

### **Emotion Suppression and Culture**

An important aspect of forgiveness that should receive attention consists of the emotions involved. Various strong emotions are experienced during an offense or when granting forgiveness. However, our culture influences our expression of those emotions. Culture plays

an important role in creating beliefs about “how emotions should be experienced and expressed” (Ekman & Friesen, 1969 as cited in Roberts, Levenson, Gross, 2008, p. 82) during our social interactions.

Emotional suppression is the “inhibition of emotion-expressive behavior during an emotion episode” (Roberts et al., 2008, p. 82). Emotional suppression has distinct cultural differences. Generally, individualistic cultures seek self-expression; thus, expressivity of emotion is common when interacting with others. Collectivistic cultures believe that expression of emotions can harm relationships; therefore, it is important to continuously regulate one’s emotions (Butler, Lee, & Gross, 2009). Suppression has been found to be positively correlated with certain cultural values. Some cultures value Power Distance, which consists of giving more power to individuals with higher status, and “encourage self-regulation” (Matsumoto, Nakagawa, & Yoo, 2008, p. 926) when relating to someone of higher status. Therefore, cultures that highly value Power Distance use more suppression (Matsumoto et al., 2008).

#### **Culture’s effects on emotion suppression.**

Butler, Lee, and Gross (2007) conducted a two-part study to test how suppression and culture impacted one’s conversations with others. The first part consisted of questionnaires. The Asian Values Scale (Kim, Atkinson, & Yang, 1999 as cited in Butler et al., 2007) and the European American Values Scale (Wolfe, Yang, Wong, & Atkinson, 2001 as cited in Butler et al., 2007) were used to test which cultural values the 166 female participants agreed with the most. However, the participant’s ethnic background was noted as well. The Asian Values Scale relates to collectivistic cultural values and the European American Values Scale relates to individualistic cultural values. Based on questionnaires, investigators found that participants with European American values used less suppression in daily life than those with Asian values.

It was also found that participants with European American values had a positive correlation between suppression and self-protective goals. Because those with European values usually come from individualist cultures, this finding would be expected, due to a higher focus on the individual. After the questionnaires were completed, the participants were paired and watched an emotion-evoking video. Then, some participants were assigned to suppress their emotions while conversing with the other about the film (Butler et al., 2007).

This study employed different data collection methods (questionnaires, interviews, videos, etc), possibly increasing its validity. However, this study only included female participants because females are generally better able to express emotions. By using a sample that includes males and females, different conclusions could be made. In regards to the Asian Values Scale and European American Values Scale, the scales make it possible to place participants accurately along a dimension of individualistic-collectivistic cultures. However, one must note that all participants in the study were impacted by considerable exposure to the American culture. The Asian Values Scale and European American Values Scale would be relevant and useful in the current study because one would want a different manner of identifying if participants are from collectivistic or individualistic cultures, rather than only using self reported cultural background.

### **Suppression's effect on responsiveness and memory.**

The study done by Butler, Lee and Gross (2007) expanded previous findings by also investigating how suppression affects responsiveness. Responsiveness is defined as “the ability to attend to a social partner and to adapt one’s own behaviors to accommodate him or her” (Butler et al., 2007, p. 32). One may hypothesize that responsiveness would decrease because emotion suppression uses many cognitive resources and the suppressor’s attention is diverted. In

the study carried out by Butler and associates (2007), those with European American values were more nonresponsive than participants with Asian values when suppressing their emotions while talking about an emotion-evoking film. Participants with European American values do not suppress their emotions often; thus, when they do suppress, they become less responsive to the other's emotions and expressions. Those with Asian values would still be able to respond because they are more accustomed to suppressing their emotions due to their cultural norms. In this study, it was also found that partners of suppressors viewed the suppressor as "hostile and withdrawn" (Butler et al., 2007, p. 40). Participants with European American values who suppressed their emotions were viewed as more hostile, thus, they were treated in a hostile manner by their partner. It appears that there are cultural differences in emotion suppression. However, suppressors are viewed as hostile, regardless of culture.

Suppressing does not only impact cognitive resources by producing less responsiveness in the suppressor, but can also produce memory impairments (Gross, 2001). One study had subjects view slides while some participants suppressed their emotions. It was found that those who suppressed their emotions had poor recollection about the information in the slides. If a victim of an offense attempts to suppress their emotions during the offense, they might not be able to recall what happened or may recall false information. During an offense, it is important for an individual to be responsive or else the conflict can quickly escalate.

### **Physiological consequences of suppression.**

Does continuously suppressing one's emotions save one from experiencing risky physiological arousal? Research indicates that physiological responding is increased during suppression, regardless of cultural background.

Roberts, Levenson, and Gross (2008) investigated the relationship between suppression and physiological arousal. Roberts and associates (2008) had 160 participants from various cultural backgrounds watch two disgusting films while continuously recording their physiological responses. Some participants were told to suppress their emotions while watching the videos while others simply watched. Afterwards, participants rated their own emotional experience. Regarding facial expressions, participants who suppressed showed less disgust than those who did not suppress; ethnicity did not affect facial expression. This indicates that habitual suppressors were not better at hiding facial expressions than those who did not practice much suppression. Participants who suppressed had increases in heart rate, sympathetic activation and blood pressure, regardless of ethnicity. This study indicates that suppression does lead to higher physiological responding, regardless of cultural differences. Thus, if one regularly suppresses their emotions, the increased physiological arousal can lead to health risks. One must note that all participants had been greatly exposed to American culture, which can cause those from collectivist cultures to not suppress their emotions as much as their original culture enforces. This study suggests that a culture that imposes constant suppression in social interactions might be predisposing those individuals to greater health risks.

It appears that emotion suppression during an offense can lead to negative consequences. Emotion suppression leads to increases in physiological arousal, regardless of cultural background. Emotion suppression may also prevent the victim from forgiving the offender. It can also lead to misunderstandings and confusion, especially if the offender and victim are from different cultures. It is important to respect and be conscious of different cultural practices and norms.

### **Emotion Expression and Culture**

**Physiological effects of emotion expression.**

Because emotion suppression does not produce physiological differences between cultures (Roberts et al., 2008), one wonders if cultural differences are evident when participants are asked to express their emotions. Butler, Lee and Gross (2009) investigated how physiological responses and emotion expression interacted. Thirty-two European American or Asian American participants watched a video that was emotion-evoking. Afterwards, participants rated how often they had felt certain emotions and then were asked to engage in a conversation with the other participant pertaining to what they had felt in response to the video. This study revealed that European Americans showed a negative correlation between blood pressure and negative emotion expression (frowns, distress, and statements). Contrastingly, Asian Americans had a positive correlation between blood pressure and negative emotion expression. These correlation differences are related to cultural differences. European Americans are accustomed to emotion expression; thus, they would be calm while expressing emotions. However, Asian Americans are encouraged to not engage in emotion expression. As a result, their blood pressure rose while they expressed more negative emotion.

The study done by Butler and associates (2009) demonstrates how conversations in our everyday life can produce physiological changes without our awareness. Emotional conversations also influence how we respond to others and how others view us. It is difficult to generalize these findings to other collectivist or individualist cultures, due to the American culture influence. However, this study reveals that cultural differences are more pronounced when participants express their emotions; when participants suppress their emotions, physiological arousal increases, regardless of culture (Roberts et al., 2008).

Relating emotion expression to forgiveness, one realizes that European Americans would be more willing to express what they feel and would be more willing to engage in dialogue concerning the offense. However, Asian Americans might feel uncomfortable expressing their emotions and may avoid having to state their feelings or thoughts. These differing practices can produce challenges when individuals from differing cultures interact. Because the current study focuses on cultural differences, emotion expression would make those differences more distinct.

### **Forgiveness and Health**

As indicated in this literature review, it is clear that emotion expression and suppression lead to physiological arousal. However, because the current study focuses on forgiveness as well, it is important to study how forgiveness affects physiological arousal.

Research has shown that unforgiveness can affect health by producing physiological responses similar to those produced during stress, which is known to greatly affect health. Studies have shown that brain activity during unforgiveness and stress are similar (Worthington & Scherer, 2004). Unforgiveness can lead to a higher production of cortisol, which is also produced during stress. There is also similar sympathetic nervous system arousal, tension in certain facial muscles and blood chemistry during unforgiveness and stress. Being unforgiving can cause allostatic load, or changes in “multiple physiological systems that allow people to” (Witvliet, Ludwig, & VanderLaan, 2001, p. 117) cope with stressors. Therefore, unforgiveness and stress are interrelated because they affect the same physiological systems, such as the immune system. By knowing that unforgiveness and stress affect the body through similar means, one could hypothesize that unforgiveness indeed impacts our health, body, and life.

### **Imagery and physiological arousal.**

Various researchers have studied the distinct relationship between the body and mind through studies of forgiveness. Two main methods have been used when studying forgiveness and health, imagery and recall. Witvliet and associates (2001) have found that being unforgiving can cause risky health problems, even if only imagining the offense. In this experiment, 72 participants imagined eight forgiveness and unforgiveness scenarios related to an offense they had experienced. Skin conductance, facial EMG, heart rate and mean arterial pressure were continuously recorded throughout the experiment. After each imagined scenario, a recovery period was conducted. This study found that skin conductance, corrugator EMG, heart rate and mean arterial pressure were significantly higher during unforgiving conditions than forgiving conditions. The results also indicated that skin conductance, corrugator EMG, and heart rate were still significantly higher for the unforgiving conditions during the recovery period. This study indicates that when one solely thinks about experienced offenses, physiological arousal occurs and continues even when one is no longer thinking about the offense. Thus, the study demonstrates how the body and mind are strongly connected. Because of the physiological arousal involved, having constant unforgiving thoughts or responses may lead to a quicker onset of certain health problems, such as heart disease. The results of this study indicate that forgiveness does not lead to such risky consequences, while unforgiveness can lead to unhealthy costs.

While the study done by Witvliet and associates (2001) showed important added significant information to the literature, it did have some weaknesses. Because participants imagined each forgiving and unforgiving response eight times, the participants gained exposure to the independent and dependent variables, possibly affecting the results. One can imagine that the offenses the participants experienced and imagined differed in severity; thus participants

might experience more physiological arousal for the offenses that were higher in severity.

However, it would be difficult to control the severity of the offenses used in the experiment due to individual differences. Despite these issues, findings from this study have been supported by other studies.

### **Recall and physiological arousal.**

Lawler, Younger, Piferi, Jobe, Edmondson, and Jones (2005) used interviews and questionnaires to study the relation between forgiveness and physiological arousal. Therefore, participants discussed the offense instead of imagining the offense. The 81 participants completed questionnaires pertaining to state forgiveness, trait forgiveness, health, social skills, spirituality, negative affect, and stress. It is important to recognize that two different types of forgiveness can be studied, trait and state forgiveness. Trait forgiveness relates to how forgiving one is overall; it is due to personality and character. On the other hand, state forgiveness relates to the forgiveness expressed for a particular offense. After completing the questionnaires, the participants were interviewed about a time they had been offended. Blood pressure and heart rate were measured throughout the entire interview. The results of this study showed that there was a statistically significant relationship between state forgiveness and health. Trait forgiveness and health also had a significant relationship. Another finding was that trait forgiveness led to less significant changes in blood pressure and heart rate during the interview.

The study done by Lawler and associates (2005) had some weaknesses and strengths. One must acknowledge that the interviewer(s) could have affected the results because they may have improved or worsened throughout the interviewing process. Also, one may argue that trait forgiveness did not have a major impact on physiological arousal because the interview focused

on a particular experienced offense; thus, it is reasonable that state forgiveness led to more changes in physiological arousal.

Interestingly, Lawler and associates (2005) and Witvliet and associates (2001) found similar results although different data collection methods were used, imagery and interviews. This indicates that unforgiveness may be bad for our health when we imagine or discuss an offense. Because physiological arousal occurred during each study, frequent thoughts or discussions about an unforgiven offense may lead to negative health consequences in the future.

### **Effects of attachment style on forgiveness and health.**

Lawler-Row, Younger, Piferi, and Jones (2006) used videotaped interviews again in a second study, which expanded previous research by finding a relationship between forgiveness, attachment style and health. In this study, 108 university students were asked to remember a time they had been betrayed by a parent and by a friend or romantic partner. Then, the participants were interviewed about the betrayals while their blood pressure and heart rate were continuously measured. After completing the interviews, a recovery time consisted of the participants completing various questionnaires. After the recovery time, participants completed the Relationship Questionnaire and Emotional Expressiveness Questionnaire. This study found that those who were securely attached were more forgiving than insecurely attached individuals, and parents were forgiven more than nonparents. Further results were gathered concerning the interview portion of the study. Insecurely attached individuals had higher systolic blood pressure during interviews and recovery times. Diastolic blood pressure was higher for all participants during the nonparent interview than during the parent interview; however, securely attached participants still showed a lower level of diastolic blood pressure.

Lawler-Row and associates (2006) demonstrated that our early relationships with our caregivers affect our future social relationships and how we cope with offenses and betrayals. The results of this study are supported by the study done by Witvliet and associates (2001); those who were more forgiving (securely attached participants) had lower increases in physiological ratings. Because of the connection between the findings of the studies conducted by Lawler-Row and associates (2006) and Witvliet and associates (2001), one might consider if attachment style was an unknown variable that influenced the degree to which participants were forgiving in the study of Witvliet and associates (2001).

The current research on forgiveness and physiological arousal indicates that being unforgiving leads to greater physiological arousal. Remarkably, this was found when participants either discussed or imagined an offense. Thus, there is a strong connection between the body and mind. Because individuals from different cultures have similar dispositional forgiveness levels, one may hypothesize that unforgiveness leads to physiological arousal in all, despite cultural background.

### **Summary**

Research indicates that levels of forgiveness are equal between individualist and collectivist cultures; however, collectivist cultures are more aware of different factors (Paz et al., 2008), such as the circumstances of the offense. In addition, culture did not lead to differences in physiological responses to suppression; all cultures experience risky physiological costs. There are differences in the occurrence of suppression between cultures. Individualist cultures suppress less while collectivist cultures use more suppression. Physiological responses only differ between cultures when participants expressed their emotions; only those from collectivistic cultures experienced physiological arousal during emotion expression (Butler et al., 2009). It is

important to remember that cultural values or teachings can affect how we interact with others and can also affect how our body responds during these interactions.

From the current literature, one learns that unforgiveness can generate risky physiological responses, such as increased blood pressure and heart rate. These responses also last for longer periods of time in unforgiving people (Witvliet et al., 2001). In contrast, forgiveness leads to less significant changes in physiological responses.

All of the studies mentioned have been very informative in the psychology field and have led to further exploration on the topic of forgiveness. However, one must address the weaknesses in the studies in order to create more reliable and valid studies. When studying forgiveness, one must be aware of the severity of the offense the participants experienced. When interviewing, researchers must be aware that the interviewer can have certain effects on the participants and may become better or worse at interviewing over time. Today, many cultures are exposed to the American culture. This can have certain effects on research pertaining to cross-cultural differences, especially if the study is done in the United States. With special planning and consideration, most of these weaknesses can be diminished.

### **Current Study**

The proposed study was created to bring together research on culture, health, emotion expression and forgiveness. Because the current study focuses on cross-cultural differences, it was important to recruit participants from various cultures. Research indicates that the culture in the United States is individualistic. Also, researchers agree that Latin American cultures are collectivistic (Shkodriani & Gibbons, 1995). Thus, mostly European American and Latin American participants were recruited. However, the Asian Values Scale and European American

Values Scale were used in order to accurately place participants along a dimension of individualistic and collectivistic cultures.

The interview method used in this study was constructed to focus on cultural and physiological reactions in relation to an experienced offense. However, through this method, we were able to utilize the different methods that are used in the psychology field to study forgiveness and physiological responses. Because emotion expression played an important role in the study, having participants focus on an emotion-evoking, experienced offense created an effective emotion-elicitor.

Using the literature, one can make certain hypotheses about the interaction of these factors. The first hypothesis is that in an interview regarding an experienced offense, those with high Asian values or from collectivistic cultures will have greater physiological responses than those with low Asian values while recalling an offense due to the emotion expression that an interview requires. This would be expected because emotion expression leads to greater physiological arousal (Butler et al., 2009). The questions that the interviewer will ask about the offense will obligate the participant to talk about the offense, thus, increasing emotion expression. Consequently, those with high Asian values or from collectivistic cultures will also have lower physiological responses during the thinking condition than those with low Asian values because they will be more comfortable with the emotion suppression that the thinking condition requires.

The second hypothesis is that participants with high European American values will have higher physiological responses than those with low European American values during the thinking condition. Participants from individualistic cultures will feel uncomfortable during the thinking process and will find it easier to express their feelings regarding the offense. Because

individualistic cultures place more emphasis on emotion expression (Butler et al., 2009), those with high European American values will be more comfortable during the recall of an offense. Accordingly, those with high European American values will have lower physiological responses during the recall condition than those with low European American values.

A third hypothesis is that those who are more forgiving will show less increase in physiological responses while recalling or thinking about the offense. The literature reveals that being unforgiving leads to increased physiological arousal (Witvliet et al., 2001). Such increased physiological arousal is not evident when the victim has forgiven the offender.

## **Methods**

### **Participants**

Participants for this study were recruited from the Bethel College community, Our Lady of Guadalupe community and the Newton Community. There were 40 participants; 13 males and 27 females. The age range for the participants was 14-53, with a mean age of 26. Seventeen of the participants indicated their cultural background as European American, 19 were Latin American and four were in the “Other” category. In regards to religious affiliation, 13 participants were Mennonite, 15 were Catholic and 12 indicated various other religions.

### **Instruments**

Various questionnaires were used in this study. The Asian Values Scale (AVS) (Kim, Atkinson, & Yang, 1999 as cited in Butler et al., 2007) and the European American Values Scale (EAVS) (Wolfe, Yang, Wong, & Atkinson, 2001 as cited in Butler et al., 2007) were used to assess if participants’ values corresponded with collectivistic cultural values or individualistic cultural values, respectively. Thus, high scores on the AVS correspond to collectivistic cultures while high scores on the EAVS correspond to individualistic cultures. The AVS has a

coefficient alpha of 0.81 with a test-retest reliability correlation of 0.83 (Kim & Hong, 2004). The EAVS has a coefficient alpha of 0.63 (Hong, Kim, & Wolfe, 2005). Ten items were taken from each scale and randomly arranged into one questionnaire. Participants read and answered each statement using a scale of -3(strongly disagree) to +3(strongly agree). The answers were then added separately for the European American Values Scale and the Asian Values Scale, producing a sum for each scale. The use of the values scales helped place all participants on an “individualism-collectivism dimension” (Shkodriani & Gibbons, 1995, p. 765), which was important for data analyses. However, one must be cautious while using the values scales because they may be based on stereotypical views of individualistic and collectivistic cultures. The values scales might also reflect a measure of the participant’s personality instead of their cultural values. In order to evaluate if personality was a contributing factor of scores on the Asian Values Scale and European American Values Scale, a personality inventory was administered.

The NEO-PI-R Domains, taken from the International Personality Item Pool (Goldberg, 1999), measures the five factors of personality (openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism). All of the statements are similar to those found in the NEO-PI-R. The NEO-PI-R Domains has a coefficient alpha of 0.84 and a mean item intercorrelation of 0.34. The questionnaire included ten statements for each factor, five of which were reverse scored. The 50 statements on this questionnaire are answered using a five-point Likert scale. However, in the current study, participants answered “yes” or “no” to each statement due to the NEO-PI-R Domains not being administered in the customary way. Because this was done, each “yes” equaled 4.5 and each “no” equaled 1.5. One score was then calculated

for each of the five factors. Although the questionnaire was not administered in the standard way, it can still be used in the data analyses.

To evaluate empathy's role, the Toronto Empathy Questionnaire (TEQ) (Spreng, McKinnon, Mar, Levine, 2009) was administered. The coefficient alpha of the TEQ is 0.85. The TEQ has a test-retest reliability correlation of 0.81. This questionnaire consisted of 16 statements, such as, "When someone else is feeling excited, I tend to get excited too" (Spreng et al., 2009). Participants rated how frequently they behave in the manner described in each statement using the following scale: 0(never), 1(rarely), 2(sometimes), 3(often), and 4(always). Eight of the statements were reverse scored. The responses were added into one sum for the questionnaire.

A second measure of empathy was recorded during the interview. Using a scale from 0(not at all)-10(completely), participants rated their answer to the following question: To what degree do you now understand and share the feelings of the person who hurt you? The same scale was used to measure forgiveness through the following question: To what degree do you now forgive the person who hurt you?

Debriefing sheets were also used in this study. In the debriefing, participants were asked about their age, gender, years of school completed, major/profession, religious denomination and cultural background. When asked about cultural background, participants could indicate European American, Asian American, African American, Latin American, Native American and Other. Participants were also asked to provide their hypothesis for the study in which they had participated. Participants could also provide questions or concerns regarding the study.

To measure physiological responses, the ActiveTwo Data Acquisition System (BioSemi, Amsterdam, Netherlands) was used. Two electrodes were placed on the face to measure

corrugator EMG. Two electrodes located on the torso measured heart rate while three electrodes on the left hand measured skin temperature and skin conductance.

A RadioShack FM wireless intercom (3 channels) was also used. The researcher, who was in another room, listened to the interview using the intercom.

## **Procedure**

First, the forty participants were randomly assigned into one of two groups. Two equal groups were created ( $n=20$ ); one group recalled or discussed the offense first while the other group thought about the offense first. The two conditions were thinking about the offense and recalling the offense. However, all participants experienced both conditions, making this a within subjects design. This study may also be classified as a between subjects design because of the interest between cultures. Thus, it is a mixed design.

Upon arriving, participants were connected to the ActiveTwo Data Acquisition System (BioSemi, Amsterdam, Netherlands). Electrodes were attached to the face, torso and left hand in order to measure corrugator EMG, skin temperature, skin conductance (GSR) and heart rate. Participants were encouraged to have an offense in mind before the interview started, a time in which they were hurt or betrayed by a friend, family member or significant other.

Participants were then led to an interview room where they were seated. In this study, there were two interviewers and a researcher. One interviewer interviewed the participant while the researcher, in a different room, monitored physiological responses, listened to the interview via wireless intercom and recorded the participant's answers to the interview questions.

During the interview, a two-minute baseline recording was conducted first for all participants ( $N=40$ ). Then, depending on which condition participants experienced first, participants recalled or thought about an experienced offense. If recalling, participants described

the incident without using names; participants had about one minute to recall the incident. Then, they would use a scale (0:Not at all-10:Completely) to rate their empathy and forgiveness towards the offender. If thinking about the offense, participants thought about the incident, the hurt they had felt, and their emotions and thoughts at the time of the incident for two minutes. After finishing the first condition, another two-minute baseline was recorded. However, during this baseline, participants discussed what they did to relax. This was done in order to ensure that the participant was no longer thinking about the offense and was relaxed. Afterwards, participants went through the second condition (recall or think) that they had not yet experienced. For the second condition, participants recalled or thought about the same offense that was used in the first condition. Once the second condition was completed, participants answered questions regarding their relation to the offender, place in which the incident occurred and their age at the time of the incident. The interview concluded by conducting a two-minute baseline in which the participant rested.

After the interview was completed, the electrodes were removed from the participants' body. Participants were then taken to a different room in which they completed several questionnaires. Participants were given the European American Values Scale, Asian Values Scale, Toronto Empathy Questionnaire, and the NEO-PI-R Domains, given in a random order. Lastly, subjects completed a debriefing sheet.

### **Data Preparation**

Several steps were taken in order to run data analyses. All questionnaires were scored and entered in an Excel spreadsheet. The participants' age, gender, cultural background, and religion were coded and also entered into the Excel spreadsheet. For data analysis purposes, all

participants who indicated their cultural background as “Other” were coded as “Latin Americans” based on AVS and EAVS scores.

EEGLAB and LabVIEW were used for preliminary steps in analyzing the physiological data. Then, using averages across all 40 participants, we calculated the second in which the physiological arousal was highest for the participants in each condition. We then used the physiological data for that second to run statistical tests. Therefore, all physiological data reflect differences from the baseline recording. All data, psychological and physiological, were entered into an Excel spreadsheet. Variables that were not normal were transformed into normal variables using Box-Cox transformations. To run statistical tests, R was used.

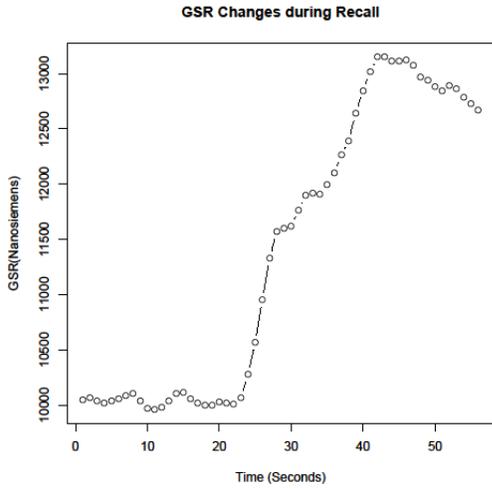
## **Results**

### **Preliminary Analysis**

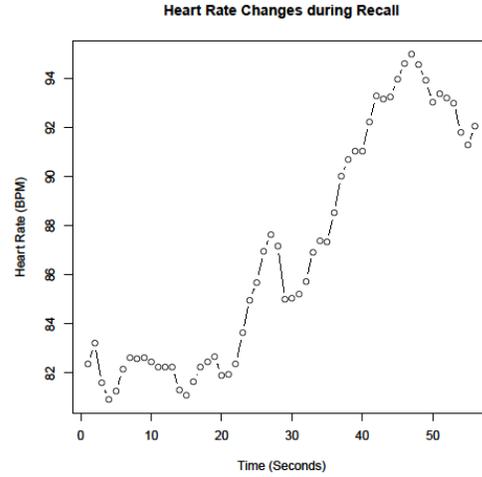
Before beginning statistical analyses, line graphs were created to investigate if the experimental conditions (recall and thinking) did produce physiological changes. As shown in figures 1-4, skin conductance and heart rate did increase during the recall and thinking condition. The first twenty seconds of each graph are the baseline recording preceding the condition. Thus, it is evident that the conditions did cause physiological arousal.

### **First Hypothesis**

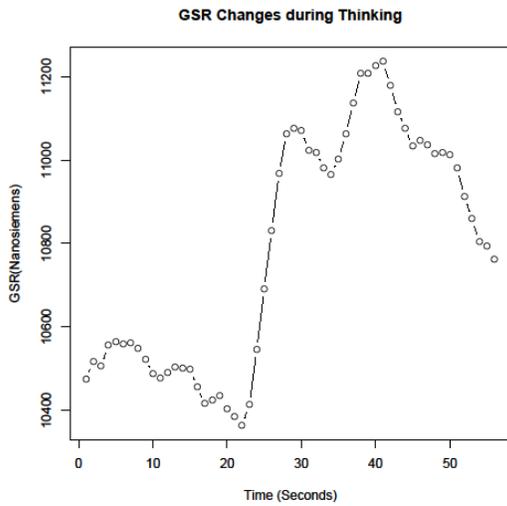
The primary hypothesis for the current study is that those with higher Asian values will experience greater physiological arousal than participants with low Asian values during recall. Participants with high Asian values will also have lower physiological responses than those with low Asian values during the thinking condition. In order to test this hypothesis, two-sample t-tests were used.



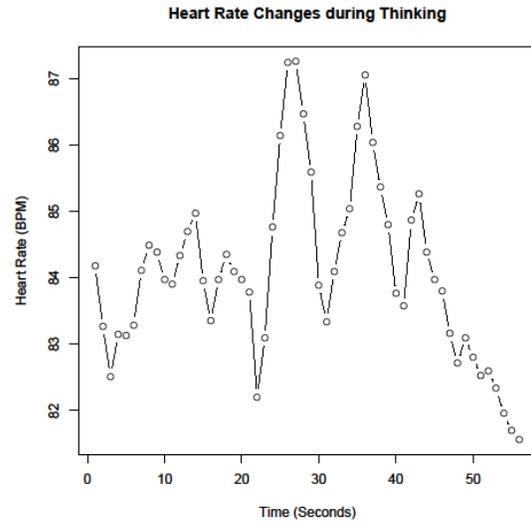
**Figure 1.** This line graph demonstrates that skin conductance peaked approximately 20 seconds into the recall condition.



**Figure 2.** This line graph demonstrates that heart rate increased to 95 BPM twenty-five seconds into recalling the offense.



**Figure 3.** Skin conductance showed the greatest arousal approximately 20 seconds into the thinking condition.



**Figure 4.** The greatest arousal in heart rate occurred at approximately the tenth second of the condition.

In order to run two-sample t-tests, a median split divided the Asian Values Scale (AVS) scores into two groups based on scores; high scores ( $n=20$ , mean=1.7, sd=5.552) and low scores ( $n=20$ , mean=-15.3, sd=3.477). Two-sample t-tests were used to test if there was a significant difference in physiological measures between the AVS groups in each condition. None of the differences were significant for the recall condition. However, the means of the physiological measures for each group were studied. As seen in Table 1, the means for EMG and skin conductance were higher during the recall of an offense for those who scored high on the AVS rather than low AVS scores. However, skin temperature decreased more for those with low AVS

	High AVS Scores (n=20)				Low AVS Scores (n=20)			
	Recall		Thinking		Recall		Thinking	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Heart Rate	10.338	9.521	1.679	8.802	13.753	11.178	2.925	7.318
EMG	11009.77	130885.92	-25177.66	107035.62	-4717.10	46580.39	34948.56	76974.53
GSR	3.328614	4.327044	0.271721	0.743653	2.838621	3.661677	0.928566	1.60167
Skin Temp	-0.030	0.153	0.047	0.09	-0.059	0.144	0.016	0.078

**Table 1.** Physiological differences from the baseline recording for those with high and low scores on the AVS during both conditions (recall and thinking). Heart rate measured in bpm, EMG measured in integrated EMG activity, GSR measured in microsiemens and skin temperature measured in degrees Celsius.

scores rather than high AVS scores; lower skin temperatures signify less relaxation. Also, those with high AVS scores had an increase of 10 bpm while those with low AVS scores had a greater increase of 14 bpm, contrary to what was predicted.

It is predicted that those with high AVS scores will have lower physiological responses during the thinking condition than those with low AVS scores. The results indicate that there was a significant difference in EMG between AVS groups during the thinking phase ( $t(34.505)=-2.0395$ ,  $p=0.049$ ); those with high AVS scores showed less response in EMG. Also, the means

for heart rate and skin conductance were lower for those with high scores on the AVS, as seen in Table 1. Temperature also increased more for those with high AVS scores during the thinking condition, which indicates more relaxation. It is evident that only EMG measures during the thinking condition supported the first hypothesis, however some means were in the predicted direction.

## Second Hypothesis

The second hypothesis is that participants with high European American values will have higher physiological responses during the thinking condition than those with low European American values. Likewise, participants with high European American values will demonstrate lower physiological responses than those with low European American values during the recall condition. A median split was used to create two groups, those who scored higher ( $n=20$ , mean=19.92, sd=3.014) and those who scored lower ( $n=20$ , mean=8.425, sd=6.548) on the European American Values Scale (EAVS). Two-sample t-tests were used to further investigate if those with higher European American values showed more arousal while thinking of the offense. The two-sample t-tests resulted in no statistically significant differences in physiological data between those who scored high and low during the thinking condition.

	High EAVS Scores (n=20)				Low EAVS Scores (n=20)			
	Recall		Thinking		Recall		Thinking	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Heart Rate	11.162	9.666	1.184	10.342	12.929	11.254	3.419	4.718
EMG	6515.662	46067.3	-2447.09	96542.02	-222.992	131472.2	12217.99	99251.53
GSR	3.272962	4.545905	0.835848	1.637766	2.894272	3.393645	0.364439	0.739056
Skin Temp	-0.049	0.133	0.037	0.099	-0.040	0.163	0.026	0.069

**Table 2.** Physiological differences from the baseline recording for those with high and low scores on the EAVS during both conditions (recall and thinking). Heart rate measured in bpm, EMG measured in integrated EMG activity, GSR measured in microsiemens and skin temperature measured in degrees Celsius.

However, the means were also studied and are shown in Table 2. For the thinking condition, one would expect to see greater arousal for high EAVS scores than low EAVS scores. However, only skin conductance was higher for the thinking condition for those with high EAVS scores, compared to physiological data for those who scored low on the EAVS. For the thinking condition, heart rate and EMG showed less arousal for high EAVS scores than for low EAVS scores; this was contrary to the hypothesis. Also, skin temperature means were not in the predicted direction.

Next, we used two-sample t-tests to test if high EAVS scores would show less physiological arousal during the recall condition. None of the physiological measures produced a significant difference between EAVS groups for the recall condition. The means for the two groups are given in Table 2. The heart rate average was lower during the recall condition for those with high EAVS scores than for the low EAVS scores, as predicted. Contrary to the hypothesis, EMG, skin conductance and skin temperature showed more arousal during the recall condition for those with high EAVS scores. Data analyses demonstrate that the second hypothesis was not supported.

#### **Exploratory analyses for primary and secondary hypotheses.**

Various multiple regressions were also used to investigate the primary and secondary hypotheses further. It was found that, together, AVS scores and religious affiliation predicted skin conductance during the recall phase ( $F(2, 37)=3.785, R^2=0.125, p=0.0319$ ). However, AVS scores and religious affiliation did not predict any other physiological measures during recall or thinking.

To further test the hypotheses, we used a different measure of culture, self indicated cultural background specified on the debriefing sheets. Two groups were created, European

Americans (EA) and Latin Americans (LA). Two-sample t-tests were used to identify if there was a significant difference in physiological measures between cultural groups during the conditions. The tests did not produce any significant differences between European Americans and Latin Americans for the recall phase. For the recall condition, none of the means were in the predicted direction; European Americans demonstrated greater physiological arousal than Latin Americans during recall. Likewise, statistical tests did not produce any statistically significant differences between the two cultures during the thinking condition. However, the means for the thinking condition were in the predicted direction for heart rate (EA mean: 2.691 bpm, LA mean: 2.015 bpm), EMG (EA mean: 325291.1, LA mean: 289801.3), and skin conductance (EA mean: 5.113365microsiemens, LA mean: 4.478754microsiemens); European Americans showed a greater increase than Latin Americans in heart rate, EMG, and skin conductance during the thinking condition.

### **Third Hypothesis**

The third hypothesis predicts that those who are more forgiving will experience a smaller increase in physiological arousal during the recall and thinking conditions. To test this hypothesis, linear regressions were used to investigate if forgiveness (mean=6.875, sd=3.172) was a predictor of the physiological measures during each condition. For the recall condition, forgiveness did not predict any of the physiological measures. However, one would expect a negative coefficient because more forgiveness leads to less physiological arousal. In the recall condition, skin conductance ( $r=-0.227$ ,  $p=0.158$ ) and skin temperature ( $r=-0.261$ ,  $p=0.104$ ) showed a negative correlation, albeit weak correlations. Linear regressions for the thinking condition demonstrated that forgiveness did not predict any of the physiological measures for the thinking condition. However, heart rate ( $r=-0.145$ ,  $p=0.371$ ) and temperature ( $r=-0.045$ ,

$p=0.784$ ) had a weak, negative correlation for the thinking condition. The third hypothesis was not supported.

### **Forgiveness**

Several exploratory analyses were done. First, forgiveness averages between groups were studied. In regards to forgiveness ratings given by participants, it was found that European Americans (mean=7.412, sd=2.665) were more forgiving than Latin Americans (mean=6.478, sd=3.505). Forgiveness was similar across religions; Catholics (mean=7.0, sd=3.024), Mennonites (mean=6.962, sd=3.497) and other religions (mean=6.625, sd=3.255) showed similar forgiveness ratings. It was also found that those who scored high on the AVS (mean=6.15, sd=3.293) were less forgiving than those who scored lower on the AVS (mean=7.60, sd=2.949). Also, participants who were younger (mean=7.22, sd=2.949) were more forgiving than older participants (mean=6.30, sd=3.549).

### **Empathy**

Two different measures of empathy were recorded in the current study, state empathy and trait empathy. State empathy was measured during the interview through participants' ratings of empathy towards the transgressor. Trait empathy, due to personality, was measured using the Toronto Empathy Questionnaire. Linear regressions demonstrated that state empathy was not a significant predictor of physiological responses in the recall condition. However, skin conductance ( $r=-0.032$ ,  $p=0.847$ ) and empathy had a negative correlation during the recall condition, signifying that more empathy led to less skin conductance, or sympathetic nervous system arousal, during recall. Also, empathy was not a predictor of physiological measures in the thinking condition. Nevertheless, there was a negative correlation between empathy and heart rate ( $r=-0.168$ ,  $p=0.301$ ), EMG ( $r=-0.018$ ,  $p=0.910$ ), and skin conductance ( $r=-0.231$ ,

$p=0.152$ ) during the thinking condition. It is important to note that these were all weak correlations.

The Toronto Empathy Questionnaire was not a predictor of any physiological measures during the recall and thinking conditions. Except for EMG ( $r=-0.021, p=0.9$ ) in the recall condition, all correlations were positive.

**Culture and Personality**

Using a two-sample t-test, it was found that a participant’s indicated cultural background on the debriefing sheet did predict scores for the EAVS ( $t(37.986)=3.177, p=0.003$ ) and AVS ( $t(37.349)=-5.049, p=1.186e-05$ ). In regards to AVS scores, European Americans (mean= $-13.618, sd=5.776$ ) scored lower than Latin Americans (mean= $-1.761, sd=9.039$ ). On the EAVS, European Americans (mean= $18.082, sd=5.789$ ) scored higher than Latin Americans (mean= $11.282, sd=7.747$ ).

We then investigated if each of the five factors was a predictor for the AVS using linear regressions. Personality was not a significant predictor of AVS scores. We then used personality factors to predict EAVS scores. Conscientiousness ( $r=0.328, p=0.0383$ ) and neuroticism ( $r=-0.409, p=0.00862$ ) were significant predictors of EAVS scores.

**Age and Value Scales**

Participants were split into two groups based on their age; younger ( $n=25$ ) than 25 years and older ( $n=15$ ) than 25 years. We then used a two-sample t-test to see if there was a significant difference

Age	European American	Latin American
Older	2	13
Younger	15	10

**Table 3.** Chi-squared test between age and culture.

between the age groups on AVS scores; we found that age was not statistically significant,

$t(30.854)=0.285, p=0.777$ . However, there was a significant difference between older participants (mean age=10.767,  $sd=8.859$ ) and younger participants (mean age=16.216,  $sd=6.229$ ) on the EAVS ( $t(22.388)=-2.092, p=0.048$ ). As seen in table 3, a Chi-squared test reveals that there are significantly more older Latin participants in the “older” category ( $\chi^2(1)=8.355, p=0.004$ ).

### **Religion**

The religion that participants indicated on their debriefing sheets was coded into three categories; Mennonite ( $n=13$ ), Catholic ( $n=15$ ), and Other ( $n=12$ ). An ANOVA was used to identify if there was a significant difference between religions on the value scales. It was found that there was a statistical difference between religions on the AVS scores ( $F(2)=13.621, p=3.689e-05$ ). There was also a statistical difference between religions on the EAVS, ( $F(2)=5.8217, p=0.006336$ ).

### **Condition Order and Physiological Measures**

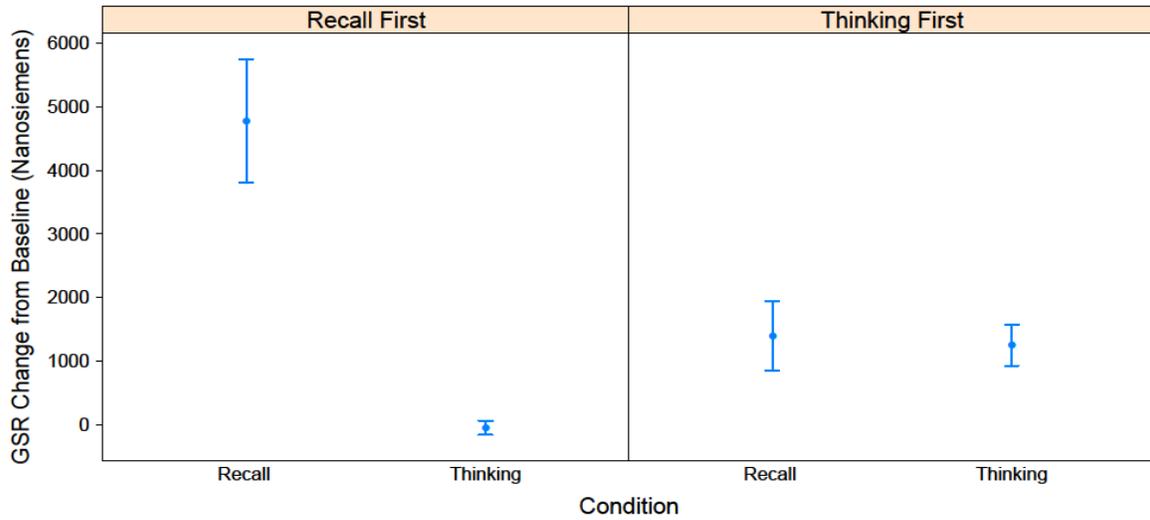
Because this study employed a mixed design, we investigated if physiological measures were significantly different during each condition, recall and thinking. Paired t-tests were used to compare the physiological measures for the recall and thinking condition. Results show that heart rate ( $t(39)=4.887, p=1.787e-05$ ), skin conductance ( $t(39)=3.730, p=0.000608$ ) and skin temperature ( $t(39)=-3.492, p=0.00121$ ) differences between the two conditions were all statistically significant; heart rate and skin conductance were significantly higher during the recall condition while temperature was significantly higher during the thinking condition.

We then proceeded to investigate if the order of conditions also impacted physiological measures. We determined which participants had been assigned to the recall condition first, and which were assigned to the thinking condition first. As seen in Figures 5 and 6, skin

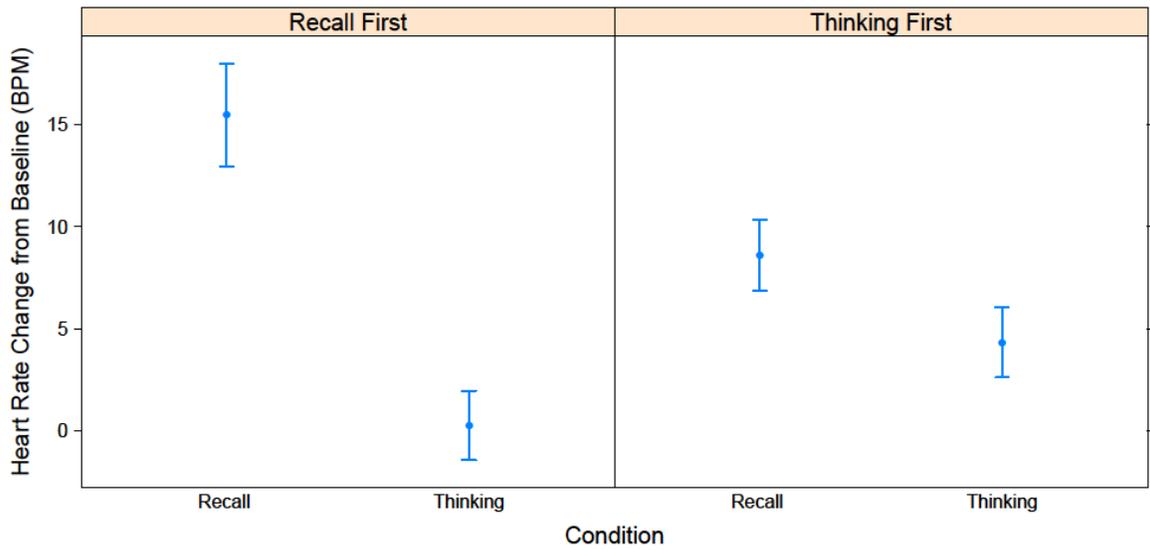
conductance and heart rate had greater increases from the baseline recording when the participants recalled first. It is important to note that Figures 5 and 6 were made with physiological data that had not been transformed using Box-Cox transformations while statistical analyses used physiological data that had received Box-Cox transformations. Two-sample t-tests were used, comparing the two condition order groups on the physiological measures. Heart rate ( $t(33.893)=2.195, p=0.035$ ) and skin conductance ( $t(37.881)=3.8447, p=0.000448$ ) had significantly higher increases if the participants recalled first. It was also found that skin conductance ( $t(27.376)=-3.9754, p=0.000463$ ) and skin temperature ( $t(37.451)=2.815, p=0.007735$ ) showed more arousal if the participant was in the thinking condition first.

### **Culture, Condition Order, and Physiological Measures**

It was found that in the recall first condition ( $n=20$ ), twelve participants were Latin American and eight were European American. In the think first condition ( $n=20$ ), eleven participants were Latin American and nine were European American. More graphs were made using physiological data that was not transformed using Box-Cox transformations (Figures 7 and 8). These graphs show condition order, scores on the Asian Values Scale, and skin conductance or heart rate changes from the baseline recording. A median split divided the Asian Values Scale (AVS) scores into two groups; high scores ( $n=20, \text{mean}=1.7, \text{sd}=5.552$ ) and low scores ( $n=20, \text{mean}=-15.3, \text{sd}=3.477$ ). By studying the graphs, one learns that skin conductance was always higher during recall except for those with low AVS scores who were in the thinking condition first. The graphs also display that heart rate was always higher, regardless of condition order and AVS scores. These graphs suggest a cultural difference when the participants first thought about the offense.



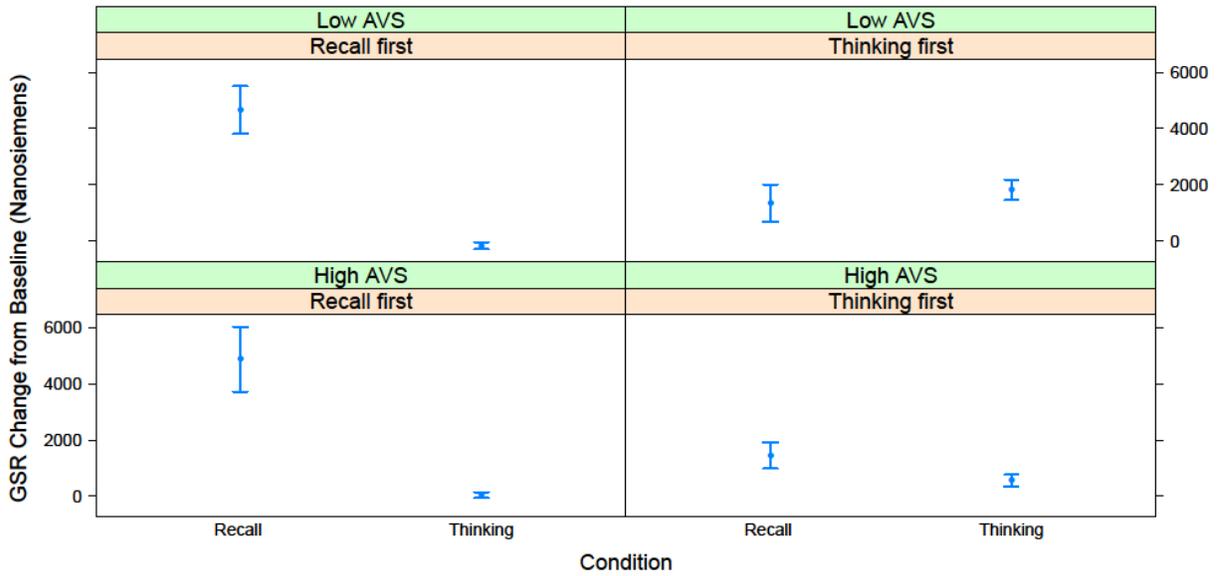
**Figure 5.** This graph demonstrates skin conductance changes from baseline during each condition based on condition order. Data used to make this graph did not receive Box-Cox transformations.



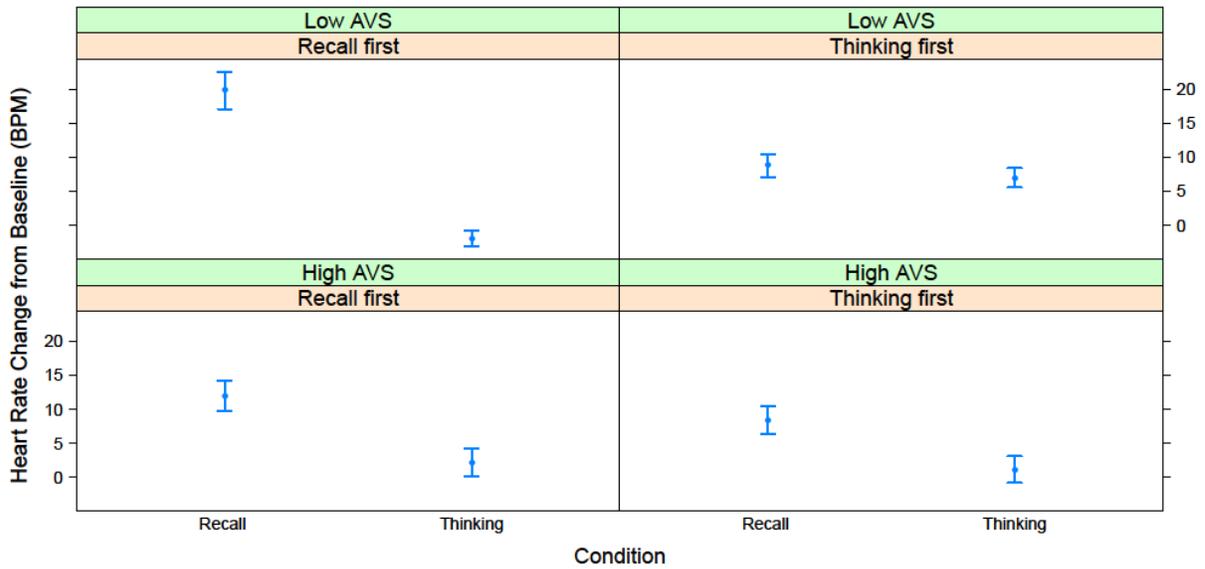
**Figure 6.** This graph demonstrates heart rate changes from baseline during each condition based on condition order. Data used to make this graph did not receive Box-Cox transformations.

Because of the cultural patterns found in the thinking first condition, a subset of data was created which included only those who were in the thinking first condition ( $n=20$ ). Among those who experienced the thinking condition first, eleven participants scored low on the AVS and nine scored high on the AVS. Two sample t-tests were done, comparing the two AVS groups on skin conductance. It was found that, in the thinking first condition, there wasn't a statistically significant difference between the two AVS groups during recall ( $t(17.673)=0.0893, p=0.9298$ ). However, there was a statistically significant difference between these groups during thinking ( $t(16.38)=-2.167, p=0.04531$ ). In regards to the means of GSR, they were in the predicted direction for the recall phase; those with high AVS (mean=1449.396) scores had a greater GSR average during recall than those with low AVS scores (mean=1349.324). The GSR means were also in the predicted direction during the thinking condition; those with high AVS scores (mean=553.7772) had a lower mean during thinking than those with low AVS scores (mean=1821.3623).

Two sample t-tests were also used to find significant differences in heart rate between AVS groups for those who were in the thinking first condition. It was found that there was not a statistically significant difference in heart rate between the AVS groups for the recall ( $t(15.678)=-0.1142, p=0.9105$ ) and thinking condition ( $t(14.319)=-1.6725, p=0.1161$ ). The heart rate means were also studied. The means during the recall were not in the predicted direction; the participants with high AVS scores (mean=8.366) showed less increase in heart rate compared to those with low AVS scores (mean=8.797), albeit a small difference. However, the heart rate means for the thinking condition were in the predicted direction; those with high AVS scores (mean=1.126) had a lower heart rate during thinking compared to those with low AVS scores (mean=6.969).



**Figure 7.** Skin conductance changes from baseline during each condition. A median split was used to divide the AVS scores into two groups – those who scored high and those who scored low.



**Figure 8.** Heart rate changes from baseline during each condition. A median split was used to divide the AVS scores into two groups – those who scored high and those who scored low.

## **Discussion**

This study adds to the literature by combining culture, forgiveness, physiological measures and emotion expression. It also explores the unique connection between body and mind. In the current study, it was proposed that those with high Asian values on the AVS would demonstrate a greater increase in physiological responses while recalling an offense compared to those with low Asian values. It was also hypothesized that high Asian values would lead to lower physiological responses than low Asian values during the thinking condition. Results indicate that participants with high Asian values demonstrated significantly lower physiological arousal in EMG while thinking of an offense.

The second hypothesis was that participants with high European American values, or high EAVS scores, would experience greater physiological arousal than those with low European American values while thinking of an offense. It was also hypothesized that those with high European American values would show lower physiological increase than those with low European American values during the recall condition. This study found that the second hypothesis was not supported.

In the current study, it also investigated whether more forgiveness would lead to less physiological arousal in the recall and thinking condition. It was found that skin conductance and skin temperature had a weak, negative correlation with forgiveness for the recall condition while heart rate and temperature showed a weak, negative correlation in the thinking condition. Thus, the third hypothesis was not supported in the current study.

### **EMG Measures During the Thinking Condition**

The finding that supported the first hypothesis was that EMG was significantly lower during the thinking condition for those with high AVS scores, compared to those with low AVS

scores. This indicates that those with high AVS scores frowned less while thinking of the offense.

The thinking condition of the interview in the current study corresponded to emotion suppression. The literature states that those from collectivistic cultures (high AVS scores) use more emotion suppression on a daily basis. Emotion suppression includes hiding facial expressions, thus, negative facial expressions, such as frowning, are decreased. It is evident that those who scored high on the AVS were practicing their cultural norms by hiding their emotions, verbally and nonverbally.

### **Cultural Influences on Emotion and Health**

The current study indicates that our culture impacts how our body responds when we discuss or think about an offense we have experienced. These physiological and cultural responses often occur without our conscious awareness. If one is from an individualistic culture, then one would be more comfortable discussing an offense (Butler et al., 2009). Also, one would be more likely to discuss what one is feeling during the offense. By discussing the offense, the victim and offender can perhaps resolve the conflict, leading to forgiveness. Based on the results of the current study, it is difficult to predict the physiological consequences of emotion expression and suppression for those from individualistic cultures.

Those from collectivistic cultures are not at ease when they have to discuss an offense, as indicated in the current study by the increased physiological arousal. Therefore, they would not be as likely to confront an offender nor would they be likely to discuss the offense with others. However, research demonstrates that emotion suppression leads to increased physiological arousal, regardless of cultural background (Butler et al., 2007). Thus, it seems that those from collectivistic cultures may be more predisposed to negative health consequences because both

emotion suppression and emotion expression lead to higher physiological arousal; although emotion suppression may be more comforting, it does not have good health consequences for the suppressor. However, the current study seems to suggest that physiological arousal experienced during emotion suppression is not as high as what is experienced during emotion expression. In other words, although physiological arousal increased during the thinking and recall condition, the increase was not as high during the thinking condition for those with collectivistic cultural values. The current study implies that those from collectivistic cultures do not frown as often during emotion suppression as those from individualistic cultures.

### **The Effects of Culture and Religion on Forgiveness Ratings**

An important focus of the current study was to identify if those who were more forgiving would have lower physiological arousal. It was found that certain physiological measures produced negative correlations during the conditions, although weak correlations; more forgiveness leads to less physiological arousal. Why were physiological differences not as pronounced between those who were forgiving and unforgiving, as the literature suggests? One may reason that physiological measures weren't significantly lower when participants from collectivistic cultures gave higher forgiveness ratings, due to cultural differences. Past research indicates that those from collectivistic cultures forgive the offender because it is expected of them (Paz et al., 2008). Therefore, people from collectivistic cultures may tend to state that they forgive the offender, when they have not personally forgiven the offender. In the current study, participants from collectivistic cultures may have given inaccurate ratings of forgiveness because they felt obligated to seem more forgiving than they actually were, while in reality they had not forgiven the offender or may have not forgiven them to such extent.

One may also reason that religion impacted forgiveness ratings. This could occur because religion confounded both cultural value scales. Thus, both religion and culture could have impacted each other in the forgiveness ratings.

Research indicates that, through prayer, religion leads to more forgiveness (Lambert, Fincham, Stillman, Graham, & Beach, 2010). Researchers hypothesize that prayer primes “empathy, compassion, love and selfless concern for others” (Lambert et al., 2010, p. 130). However, in the current study, it was found that forgiveness ratings were similar among different religious affiliations. One may imagine that participants felt obligated to give ratings of forgiveness that confirmed to the participants’ religious beliefs and values. Thus, through influences from culture and religion, false ratings of forgiveness may have not predicted physiological responses.

### **Confounding Variables for the Value Scales**

Although the EAVS and AVS seemed to produce some predicted physiological measures that were in accordance with the current literature, the cultural differences were not as pronounced as one might expect. This could be due to the small sample size or confounding variables affecting the EAVS.

When one is studying culture, one must be aware of different factors that might impact the results of the study. In this study, it was proposed that personality, age, and religion may be contributing factors to the results. Culture was determined by scores on the AVS and EAVS. Thus, participants could be placed along a dimension of collectivistic and individualistic cultures. Because the value scales were used, one wonders if the scales measured personality rather than culture. This could occur because people tend to agree on the “personality characteristics of the typical member of their own culture and other cultures” (McCrae &

Terracciano, 2006, p. 156). In the current study, it was found that conscientiousness and neuroticism did predict EAVS scores while the AVS was not impacted by personality.

Age could also be a confounding variable that impacted results of this study. It was found that age only impacted EAVS scores. Therefore, age was also a confounding variable for the EAVS. This signified that age influenced how participants answered on the EAVS.

Lastly, it was discovered that religion influenced AVS and EAVS scores. Because religion influenced both scales, it seems that religion and culture seem to be quite intertwined. Perhaps this occurred because some of the questions on the value scales may relate to religious beliefs, such as the following statement on the EAVS “Abortion is okay when the mother’s health is at risk” (Wolfe et al., 2001 as cited in Butler et al., 2007). Overall, it seems that the EAVS is confounded by personality, age and religion. However, the AVS only appears to be confounded by religion. Thus, one may conclude that the AVS was a more reliable measure of culture in the current study.

Although the value scales were impacted by confounding variables, it is clear that the value scales were more accurate in identifying culture, rather than self-indicated cultural background. This was evident because self-indicated cultural background did not accurately predict physiological measures during the conditions while the value scales were more successful. One may hypothesize that one can indicate that they are from a certain culture, however, their values and beliefs may correspond with another culture’s values. This might be more common in the United States, where there is always a strong American culture influence.

#### **North American cultural influence.**

Today, the North American culture has had great influences on many cultures around the world. Thus, it is important to understand how North American influence plays a role in the

current study. Latin American participants in this study were highly exposed to the American culture. For example, because the interviews were conducted in English, all participants had to speak English. Thus, by speaking English, all Latin American participants demonstrated acculturation to the American culture. In the current study, one may hypothesize that participants from an older cohort, consisting mainly of Latin American participants, may be more influenced by their native culture's values. However, in this study, Latin American participants showed lower scores for the AVS and higher scores for the EAVS, demonstrating the high exposure to the American culture and its impact on their values. It seems that influence from the American culture had impacted the values of those originally from a collectivistic culture. As indicated from past cross-cultural studies, one must be aware of the influence from the individualistic American culture when conducting a cross-cultural study in the United States.

### **Condition Order Effects**

Through exploratory analyses, it was found that the results of the current study were affected by the order in which participants experienced the conditions. Participants experienced both conditions but were randomly assigned into what condition they experienced first. However, each group did not have an equal number of Latin Americans and European Americans, preventing us from doing further statistical analyses.

Overall, condition order affected results because participants who recalled first had a much higher physiological response during recall; those who discussed an offense before thinking about the offense had a greater increase in heart rate and skin conductance. By studying figures 5 and 6, it is evident that heart rate and skin conductance were higher when the participant recalled an offense, however the difference is larger when the participants was in the recall first condition. It was then investigated how condition order, physiological responses and

AVS scores impacted each other (Figures 7 and 8). This analysis was only done with AVS due to the EAVS being impacted by various confounding variables. Skin conductance was higher during recall for those who were in the recall first condition, despite AVS scores. Heart rate was greater when the participant recalled an offense, regardless of condition order and AVS scores. However, it seems that there is a cultural difference present for the participants who were in the think first condition, a cultural difference that is not present when the participants recalled the offense first. The cultural difference is evident because skin conductance and heart rate were greater in the high AVS group compared to the low AVS group during the recall condition. Also, skin conductance and heart rate were lower during the thinking condition for those with high AVS scores compared to physiological data during thinking for those who had low AVS scores and thought first.

Why is a cultural difference evident only in those who thought about the offense before recalling? I believe that stress and nervousness affected the participants who began the interview with the recall condition, regardless of cultural background. The process of the study, being connected to a device that records physiological arousal and then discussing a personal offense with an interviewer, may have caused the participants to become anxious, nervous, stressed and tense. Also, the act of speaking may have also caused physiological increase in the subjects, especially if the first thing the participant must do is discuss the offense. On the contrary, if the participant first has time to reflect on the offense then they may ease into the interview process more effectively and at a comfortable pace. Because research shows that those from collectivistic cultures are more comfortable with emotion suppression (Butler et al., 2009), then participants with high AVS scores would be more at ease if the interview started with the

thinking condition. Thus, when the recall condition occurred, a cultural difference would be evident.

### **Empathy**

Research indicates empathy leads to less physiological arousal (Witvliet et al., 2001). In the current study, state and trait empathy were measured. It was found that state and trait empathy did not predict physiological measures during the conditions. However, it was found that state empathy did produce a weak, negative correlation for some of the physiological ratings, as would be expected. Trait empathy only produced a weak, negative correlation for EMG during recall.

Why did state empathy produce more expected correlations than trait empathy in the current study? The focus of the interviews was of a specific offense that the participants had experienced. Thus, it is logical that state empathy (empathy for a specific offense) was a better measure of empathy than trait empathy (empathy due to one's personality). However, the correlations were very weak and may not be of great meaning.

### **Future Directions**

In future replication of this study, various changes would have to be made. First, a greater sample size would be ideal. The sample should also include participants from various individualistic and collectivistic cultures. Because participants who recalled first had greater physiological responses, one may control for that by having participants do a baseline in which they discuss something relaxing before the recall of the offense. Researchers may also measure additional physiological measures during the interview, such as EEG and respiration. One may also try to have similar age ranges for participants from individualistic and collectivistic cultures. If this is done, then age might not impact EAVS scores, making the EAVS more reliable. Lastly,

researchers may seek to measure emotion suppression used by participants during the study.

This can be done by administering the Emotion Regulation Questionnaire (Gross & John, 2003 as cited in Butler et al., 2007).

Future research on the current topic may also focus on different aspects of forgiveness. For example, one may focus on the offender instead of the victim. One could investigate the extent to which offenders forgive themselves and whether self-forgiveness is impacted by culture. The investigation of culture and forgiveness will continue to grow within the psychology field, leading to exciting new findings and discoveries.

### **Implications**

The current study holds various implications. People who are involved in interventions, such as therapists or mediators, need to be aware of the physiological responses that are occurring during the intervention. Such physiological responses can be damaging to one's health and can predispose one to future health issues. Therapists also need to be conscious of cultural differences, both physiological and psychological. Because interventions mostly include discussing the offense, a victim from a collectivistic culture may be experiencing greater physiological arousal due to the emotion expression that is required. Also, those from collectivistic cultures may not be as willing to share information or participate verbally during the intervention. Therapists could create an intervention suited for certain cultural practices. For example, in an intervention involving Latin Americans, more time should be allotted for reflecting on the offense rather than only discussing the offense. Overall, the unique connection between body and mind should always be addressed in the therapeutic setting.

The current study also holds implications regarding today's culture. Due to today's increased technology, individuals may not feel the need to suppress their emotions as they would

normally do. For example, social networks, such as Facebook and MySpace, allow individuals to express their emotions while “hiding” behind a screen. These mediums may also allow individuals who constantly suppress their emotions, such as those from collectivistic cultures, to become more comfortable with emotion expression. Perhaps the emotion expression used in social networking could carry over into face-to-face interactions. Technology would then cause emotion expression to increase in cultures that use constant suppression, especially if the culture is technologically advanced.

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