A CROSS-CULTURAL COMPARISON OF EMOTIONAL EXPERIENCE: DOES CULTURE MATTER?

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THESIS ABSTRACT

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This study explored if and how culture influences the experience of emotion in two distinct groups: Indians and North Americans. Past studies have suggested that differences among persons from different cultures in the domain of emotional expression exist; however, the origin of such differences has not been determined. The purpose of this study was to explore the extent to which observed differences in emotional experiences are based on learned cultural dictates regarding the proper ways to express emotion, differences in physiological responses to emotion evoking stimuli or some combination of the two factors. It was hypothesized that the physiological differences between participants of different cultural backgrounds would be more similar than different. It was expected that cultural identification would influence the expression and intensity of the emotions experienced suggesting that culture does matter in the experience of emotions.

Indian participants and U.S. participants did not differ in their physiological response to the emotional stimuli. However, there was a significant difference in the intensity of the subjective response to the stimulus. Both groups reported neutral slides as more positive than the positive slides. The subjective intensity of the emotional response was higher for the Indian participants on all three-slide valences. On the SAM measures, the US participants reported feeling more calm while viewing the positive and the neutral slides than their Indian counterparts did; however, the Indian participants reported feeling more calm while viewing the negative slides. Similarly, the US participants reported feeling more in control of the positive and the neutral slides than their Indian counterparts did. Once again, the Indian participants reported being more in control of the negative slides than their US counterparts did. Counterintuitively, the analyses of the questionnaire data revealed that the US participants had higher interdependent self-construal and the Indian participants reported higher independent self-construal and higher positive affect. Higher level of alexithymia was associated with negative affect; however, higher level of alexithymia did not correlate with interdependent self-construal in the predicted direction. There was no correlation between affect and satisfaction with life for the Indian group; however, in the US group negative affect was associated with lower life satisfaction. In addition, there was no significant influence of acculturation or gender in the expression or experience of emotions. Limitations and directions for future research are discussed.

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I. INTRODUCTION

Stereotypes regarding the nature and origin of cultural differences in the experience and expression of emotion abound. There is widespread agreement in the West that Asians are inscrutable, Germans are authoritarian, and Americans are arrogant etc. These stereotypes are based, at least in part, on assumptions about differences in meaning of emotions generated by one's cultural background. Interestingly, little empirical work has been conducted exploring the extent to which these stereotypic differences in cultural expressions are based on differences in learned responses to emotion-evoking stimuli and/or differences in physiological responses associated with those responses.

Culture and emotion

Culture, which can be conceptualized as collective knowledge of values, beliefs and practices, has been known to influence our emotional responses (Mesquita & Frijda, 1992). People in all cultures experience emotion. The nature and intensity of emotional responses have been a topic of major research both in the field of psychology and related disciplines. Several studies have examined the degree to which emotional experience is universal and/or culturally specific. Scherer and Wallbott (1994, 1988, 1986, and 1983) conducted numerous studies comparing various cultures to examine the universality of the experience of seven main emotions (happiness, sadness, grief, fear, anger, shame, guilt, and disgust). The results of these studies suggest that regardless of culture, people

share the same basic emotional experiences; however, some differences were obtained in the frequency, duration and intensity of the emotions experienced among cultures. For example, Japanese participants reported experiencing all emotions (joy, anger, fear, sadness) more often than either Americans or Europeans. Americans reported feeling their emotions for longer durations and with greater intensities than the Europeans or the Japanese. Americans also displayed the highest degree of expressivity in both facial and vocal reactions. Both Americans and Europeans reported many more physiological sensations associated with emotions than did their Japanese counterparts. Scherer and Wallbott (1994, 1988) have tried to explain the differences they observed using the Hofstede's four dimensions of culture – individualism (IN), power distance (PD), uncertainty avoidance (UA), and masculinity (MA) – high or low ranking on these dimensions reflected differences in the intensity, duration, and frequency of the emotional experiences. For example, Wallbott and Scherer (1994) found that when Japanese experienced shame it was of relatively shorter duration than among Americans or Europeans. Furthermore, Scherer and Wallbott (1988) correlated their data from various countries with the respective country's gross national product (GNP) and concluded that participants from poorer countries tended to report more intense, longer-lasting, and distant (emotions experienced further in the past) emotions than their counterparts from more affluent countries (Matsumoto & Juang, 2004). These results suggest that not only does culture influence emotion, it may have an impact on individual's experience of emotion as well as his or her report of that experience.

The focus on the relationship between the culture and emotion has given way to a functionalist approach to understanding cultural influences on emotional experiences,

challenging the universal approach of Scherer and his colleagues (Matsumoto & Juang, 2004). According to the functionalist approach, culture shapes emotions. Researchers who espouse the functionalist approach (as opposed to the universality of emotion approach) contend that, “because different cultures have different realities and ideals that produce different psychological needs and goals, they produce differences in habitual emotional tendencies” (Markus & Kitayama, 1991, pp. 245), suggesting that emotion reflects the cultural environment in which individuals develop and live.

Contemporary studies examining cultural influences on emotional experiences suggest that the two approaches, functionalist and universalist, can be regarded as complementary. The universal approach to emotion can provide a platform upon which the cultural construction of emotional experience occurs (Matsumoto & Juang, 2004).

Theorists have linked emotional expression to the relative emphasis cultures place on individuals’ social goals. One of the primary social goals in many non-Western cultures is to adjust to the needs of others. Individuals in these cultures are concerned about the impact that their emotional expressions have on those around them. As a result, they dampen their emotional expressions in the interest of maintaining group harmony. In contrast, one of the primary goals of those in Western cultures is to establish themselves as special and different from others. Individuals in these cultures are concerned about using emotions to express their uniqueness. Therefore, they accentuate their emotional expressions as a way of asserting themselves (Kitayama, Markus, & Kurokawa, 2001; Markus & Kitayama, 1991; Mesquita, 2001).

Culture and self-construal

As researchers have attempted to develop a comprehensive account of the cross-cultural variations in emotion, the lack of shared understanding of what constitutes a cultural group has become evident. One popular characterization of cultural groups in the field of cross-cultural studies is that of collectivism and individualism, which refers to a general orientation by which people view themselves and others in their world (Deaux, 1996). Triandis and his colleagues (Triandis, Bontempo, Villareal, Asai, & Lucca, 1988; Triandis, McCusker, & Hui, 1990) have defined a collectivist culture as a culture in which individuals see themselves as part of a group, value group goals more than personal goals, and show strong emotional attachment to the group. An individualist culture, on the other hand, is the one in which individuals value their self-reliance and achievement and emphasize personal goals more than the goals of the group (Triandis, McCusker, & Hui, 1990).

Critics have argued that the cultural model of collectivism and individualism is too general. The categorization of culture on such dimensions as individualism and collectivism does not provide a causal explanation for the differences observed among cultures. Therefore, culture cannot be used as an explanatory independent variable in cross- cultural studies of psychological processes. Most of the cross cultural studies conducted to date are based on the cultural identification of the participants but because of the conceptual and the terminological issues regarding the identification of cultural groups remain unresolved, the implications of cultural influence suggested by such studies is not clear (Deaux, 1996).

Some investigators have proposed that cultures can be defined directly using psychologically relevant characteristics such as how a person views himself/herself in relation to his/her social group and values individual as opposed to social goals (Triandis, 1993). One way to investigate culture is to investigate self-construal, which is the process by which individuals perceive, comprehend, and interpret the world around them (Cross & Madson, 1997). Markus and Kitayama (1991, 1994) identify two kinds of self-construal: independent and interdependent. For people with an independent self-construal, others are less important to current self-definition or identity, and the self is seen as a complete entity without others. Others are useful for social comparison, self-appraisal, and as targets of actions. In contrast, people with an interdependent self-construal view the self as connected to or dependent on the surrounding social context, and others are integral to that individual's experience. The sense of individuality in an interdependent self includes attentiveness and responsiveness to others and the expectation that such attention will be reciprocated (Markus & Kitayama, 1991, 1994).

Cognition and emotion

Much of the research on emotions in social psychology and related areas of psychology is either explicitly cognitive in nature or takes account of the process of appraisal in one way or another. There is even a scientific journal devoted specifically to exploring the relationship between cognition and emotion. One of the most heated controversies in psychology in recent years is a dispute over the role of cognition in generating emotion and how best to define cognition with reference to emotion (Rusting, 1998). Cognition is widely recognized as an important if not critical aspect of emotions. The essence of the cognitive perspective is the idea that in order to understand emotions

one must understand how people make judgments about events in their environment for emotions are generated by judgments about the world. In other words, emotion requires thought (Arnold, 1960).

Arnold (1960) defined the direct and immediate sensory judgment of environmental stimuli as appraisal. Without appraisal, there can be no emotion, for all emotions are initiated by an individual's appraisal of his/her circumstances. According to Arnold the proper way to think about the sequence of events that culminate in the experience of emotion is perception-appraisal-emotion (Arnold, 1960). In this conceptualization of emotional experience a person's past experience and his/her goals are considered important aspects of the way a person appraises a situation. Furthermore, Arnold argues that the bodily responses associated with each emotion serve as the motivation for the actions characteristic of emotion. Appraising one's situation in a particular manner sets in motion physiological responses that are experienced as a kind of unpleasant tension. When the action implied by the appraisal whether it is fleeing in fear or removing an obstacle in anger has been completed the physiological responses abate and we experience a relief from tension (Arnold, 1960). This idea is parallel to the drive reduction models of behavior. Arnold's emphasis of bodily responses led her to conclude that every emotion may be characterized by its own pattern of physiological activity and because the physical sensations we feel are different in different emotions it helps us to recognize emotions in others. Arnold reported that although there are individual differences in the expression of various emotions, there is also a core that is similar to all humans and perhaps even from man to animal (Arnold, 1969). She argued that if such a

core of similarity did not exist there would be no reliable basis on which to make judgments about the emotions of others based on their expressions (Arnold, 1969).

Arnolds' theory of emotion led to further research aimed at understanding how appraisal processes work. Lazarus developed Arnold's theory of emotion and formulated his own theory of emotion known as the cognitive-motivational relational theory (Lazarus, 1991). Central to Lazarus' model of the appraisal process is the notion that appraisals embody what he refers to as relational meaning, which he stated are the specific implications for personal well-being that a person sees in the situations confronting him/her (Lazarus, 1991). Such relational meanings are the function of both what a situation has to offer a person for good or ill and what a person brings to the situation in terms of his/her goals and intentions. According to Lazarus, in order to know how a person is going to react to a situation, we must know his/her goals and expectations with regard to that situation (Lazarus, 1991). Lazarus labels this "motivational-relational" as it describes how specific emotions arise out of the personal meanings that people bring to situations (Lazarus, 1991).

Opponents of Lazarus's view of the cognitive perspective of emotion claim that cognition is both a necessary and sufficient condition for emotion; Zajonc asserted that cognitions and emotions are independent systems and that it is possible to generate emotions without the participation of any cognitive processes (Zajonc, 1980). A number of studies conducted by Zajonc led him to conclude that to arouse affect objects need to be cognized, at least minimally (Zajonc, 1980). Critics, theorists and researchers conclude that Zajonc and Lazarus's argument differ in what they each call emotion. Zajonc equates emotion with affective reactions such as liking, disliking, preference, and

the experience of pleasure or displeasure whereas Lazarus focuses on the cognitive processes involved in complex emotions such as anger, sadness, fear, guilt, etc. Critics conclude that Zajonc's concern is with very simple positive or negative affective judgments and Lazarus's concern is with more complex emotions. Given their different foci, they may both be correct.

In order to understand the cognition-emotion relationship another emotion theorists, George Mandler proposed a theory of emotion in the context of an information-processing model of mental events. He proposed that the autonomic nervous system plays an important and essential role in generating and experiencing emotion (Mandler, 1990). His theory emphasizes the role of the cognitive interpretation of the arousal and of the events in the environment that elicit such arousal (Mandler, 1990).

Numbers of theorists have shown that thought is intimately involved in emotion; however, how specific thoughts or appraisals are related to specific emotions is yet to be fully understood. In the process of trying to understand the appraisal-emotion relationship most theorists have underestimated the social nature of the appraisal process. For example, Manstead and Tetlock (1989) found evidence that appraisals for guilt, shame, embarrassment, and even joy involved a consideration of other people in an important way. Therefore, it is clear that in order to understand human emotions, it is essential to consider them in their social context.

Culture, emotion and its expression

Researchers have suggested that individuals in collectivist cultures portray psychological distress through somatic symptoms, which are symptoms or sensations that are "perceived to originate from the body or one of its organs, in contrast to

psychological symptoms, which reflect inner psychic experience" (Mumford et al., 1991). This concept is known as somatization. Somatization involves a mode of complaint presentation influenced by culturally prescribed methods of communication, or a clinical phenomenon in which physical sensations are experienced in the place of psychological ones (Draguns, 1996). Previously, cross-cultural research indicated that people from collectivist cultures are more likely than those from individualist ones to use somatization as a form of communicating distress. Somatic symptom expression may be due to cultural values that stigmatize mental illness and consider emotional distress and affective expressions as "self-centered, asocial, distancing, and threatening to the social structure" (Yen et al., 2000). Physical problems are not perceived as threatening to social ties and are, therefore, more acceptable (Nikelly, 1988).

In addition, numerous investigators have reported that culture plays a central role in shaping how emotions are experienced and expressed (Draguns, 1996). For example, non-Western cultures typically have more rules than Western cultures restricting the open experience and expression of emotions. Consequently, non-Westerners tend to be less likely than Westerners to use emotional terms to communicate with others. Matsumoto (1989, 1992) argued that non-Western cultural groups avoid recognizing negative emotions in order to preserve social order. On the other hand, Western cultural groups tolerate and even encourage the perception of negative emotion (Matsumoto, 1992) as a means of asserting the value of self as an independent entity.

A great deal of research comparing distress across cultures is based on the implicit assumption that disorders described in official nomenclatures such as the DSM or ICD occur more or less universally and do not vary in form (Nikelly, 1988). According

to Beiser (2003) constraints on human physiology and cognitive processes probably limit the varieties of human suffering to a finite number of symptoms and symptom complexes; many, if not all of which may be recognizable across cultures. Nevertheless, culture still makes a difference. Culture dictates whether and how symptom complexes are defined as illnesses, metaphysical occurrences, or artifacts of everyday life (Beiser, 2003). Sociocultural forces such as expectations and attitudes also play an important role in defining, if not creating, illness (Draguns, 1996). For example, exploring the influence of culture in depression, theoreticians have proposed that Asian do not experience emotion in the way that Europeans and North Americans do, but suffer bodily rather than psychologically. It is established dictum now in the field of cross-cultural research that "Asians somaticize, North Americans psychologize" (Nikelly, 1988).

One question that arises in reflecting on the tendency of individuals in non-Western cultures to somaticize, rather than psychologize, involves the extent to which these observed differences reflect actual difficulty in identifying and/or describing emotions versus culturally learned responses based on beliefs about what emotions are appropriate (or inappropriate) to express. The former explanation is based on research that had identified alexithymia as a diagnostic category observed among mental patients with classic psychosomatic diseases and among patients with substance use disorders, posttraumatic stress disorders, and eating disorders (Nemiah & Sifneos, 1970). According to Nemiah and Sifneos (1970) and Nemiah, Freyberger, and Sifneos's (1976) definition, alexithymia consists of four core features: a) difficulty identifying and describing feelings; b) difficulty distinguishing feelings from bodily sensations; c) reduction or absence of symbolic thinking (lack of imaginative ability); and d) an external, operative

cognitive style. The construct of alexithymia provides a theoretical formulation that contrasts psychosomatic patients with so called neurotic patients who were not assumed to suffer from emotional expression, identification and recognition deficits. (Nemiah & Sifneos, 1976; Hendryx et. al., 1991).

Not many studies have directly examined alexithymia in non-Western and Western cultural groups. Le, Berenbaum, & Raghavan (2002) conducted a two- part study to examine the relationship between culture and alexithymia. They measured mean levels and correlates of alexithymia in three cultures: Eurpoean American (EA), Asian American (AA), and Malaysian college students. Their results showed that both Asian groups had higher levels of alexithymia than the European American group. In addition, somatization was more strongly associated with alexithymia in both Asian groups than in the EA group (Le. et. al., 2002). Mood and life satisfaction were associated with alexithymia in similar ways across groups such that, higher scores on alexithymia corresponded with negative affect and less life satisfaction. Interestingly, parental emotion socialization mediated the relations among culture, gender, and alexithymia. Although, Le et. al. (2002) obtained support for their hypothesis that culture can influence the ability to identify and communicate emotions; their findings failed to suggest how and why culture is associated with alexithymia.

Emotion, physiology and verbal labeling

Numerous studies have demonstrated that a small set of spontaneous facial expressions, postures, and vocalizations in response to emotion evoking stimuli can be observed in all cultures; however, social norms concerning whether such spontaneous emotional behavior should be concealed or displayed vary significantly from culture to

culture. Cultures also differ in the complexity of their verbal labels for emotional states. Many anthropological studies have suggested that verbal labels for specific emotional states such as disgust and depression may not exist in some cultures (Plutchik, 1980). Some even go further and suggest that individuals from such cultures may be incapable of experiencing these emotional states (Whorf, 1956). Research on alexithymia suggests that alexithymics' verbal labels for emotions are inappropriate, limited, or nonexistent, and they habitually mislabel their emotional arousal as physical illness (Neill & Sandifer, 1982). Such mislabeling of emotion has been reported as a cultural phenomenon. For example, Tahitians display alexithymic-like reactions in situations such as death of a loved one that would elicit sadness in individuals from Western cultures (Levy, 1984). The question of whether the cultural difference is a result of a failure to experience a particular emotion or the inability to label the emotion experienced is yet to be explored. A step toward resolving this question lies in comparing the physiological responses of those from different cultures to common emotion eliciting stimuli.

The study of emotion is complicated by its multiple facets, which form a significant part of all of our subjective judgments and automatic responses. Researchers have attempted to define and quantify the phenomenological experience of emotion and they have agreed on three components that accompany emotions: subjective experience, physical changes, and cognitive appraisals (Izard, 1994). The subjective nature of emotions is demonstrated by the difficulty people have verbally describing them. Self-reports are a common technique to get at the trait (how do you feel in general?) and state (how do you feel right now?) descriptions of emotion. The physiological changes associated with emotional responses are exemplified by changes in heart rate, skin

temperature and respiration. The cognitive component or labeling of emotion from environmental information appears to follow the display rules, or norms, of the individuals' culture (Tomkins, 1980).

Just as there are a number of components that explain what constitutes an emotion, there are also several theories that attempt to explain how we experience them. The literature on emotions is primarily based on four theories of emotion. The James-Lange theory proposes that emotion is the perception of one's own bodily reactions and that each emotion is physiologically distinct (James, 1896/1994). Therefore, bodily changes cause emotion. Cannon-Bard argued that the body's response is not a necessary, or even major, factor in emotion. Rather, arousal and emotion occur simultaneously and all emotions are physiologically similar (Cannon, 1927). The third theory, the facial feedback hypothesis, asserts that changes in facial expression provide information about what emotion is being felt (Tourangeau & Ellsworth, 1979). According to this theory, facial changes not only correlate with and intensify emotions but also cause or initiate emotions themselves. Although all three of these theories provide some insight into the experience of emotions, they do not take the role of cognition and its interpretation into account. The fourth theory of emotion, Schacter's two-factor theory, emphasizes the importance of cognitive processes in the experience of emotions. (Schachter & Singer, 1962). According to this theory, emotions depend on 1) the physiological arousal and 2) a cognitive label for that arousal. One of the criticisms of this theory is that there are emotions that arise independent of conscious cognitive processes. For example jumping at a strange noise in the dark and later interpreting what it was (Izard, 1994).

Additionally, complex emotions such as jealousy, disgust, grief, and depression appear to require more than one cognitive element (Izard, 1994). According to Schacter's two-factor theory, emotion depends on both physiological arousal and the cognitive label for that arousal. As a result, it may provide us with the foundation to understand the variation in emotional experiences among different cultures as it allows us to explore cognitive processes as well as physiological responses to emotion eliciting stimuli allowing us to examine the ways in which culture matters.

Current Study

In order to obtain a better understanding of the influence of culture on emotional experience the present study was conducted. For the purpose of this study, emotion was defined as a subjective, psychological experience corresponding with a group of physiological reactions occurring in response to some event. Emotional experiences consist of four different types of responses: affective responses (happiness, joy, anger, sadness), physiological responses (change in heart rate, respiration, perspiration), cognitive responses (internal/external attribution), and behavioral responses (sigh, smile, frown) (Lewis, 1993). The primary goal of this study was to investigate whether individuals from a collectivistic culture are less able to experience or express their emotional states than those from an individualistic culture. The stereotype of Asians as quiet, passive, shy, and deferential suggests that they do not express emotion as overtly as do Westerners (Al-Issa, 1982). Therefore, we were interested in investigating whether there was a discrepancy between the physiological reactions and self-report of emotions elicited by identical stimuli among individuals from two different cultures. Furthermore, we explored other individual difference variables that helped to define an individuals'

culture such as self-construal and level of acculturation. Investigating these components of culture furthered our understanding of the role it plays in determining the experience and expression of emotional event. Interestingly, Le et al. (2002) found that higher levels of alexithymia were associated with higher levels of negative affect and lower levels of positive affect and life satisfaction among all cultural groups. Also, they observed that Eastern cultural groups had higher levels of alexithymia than Western cultural groups (Le et al., 2002). The proposed study attempted to replicate these results with a different cultural group; Indians.

It was hypothesized that there would be no significant difference in the physiological reactions among people from different cultures; however, self-reported emotional experiences would differ. It was anticipated that individuals from the collectivist culture would report less intense emotional experiences than their western counterparts. We also hypothesized considerable within-group variation in the intensity of the emotions experienced and expressed. In theory, individuals grounded in a certain cultural context are more influenced by that culture's dominant model of emotional expression than those less immersed in the culture (Tsai et al., 2002). For example, Tsai and Levenson (1997) found that the more oriented to Chinese culture Chinese Americans were the less variable and more moderate their reports of affect when they discussed an area of conflict with their romantic partners compared to their American counterparts. We anticipated a parallel result, non-Westerners who are well acculturated to the Western culture would have a response pattern more similar to those of Western origin.

In the current study the two cultures represented were Indians and Americans. Indians rather than Japanese or Chinese students were chosen for this study for two

reasons: 1) to expand the exploration of the influence of culture on emotion and 2) to use a measure of Alexithymia to investigate individual differences within cultural samples. TAS-20, a reliable and valid measure of alexithymia, has been successfully translated into Hindi and cross-validated with a normal population in India, indicating that alexithymia is a valid construct within the Indian culture (Pandey et al., 1996).

II. METHOD

Participants

Thirty American participants and 30 Indian participants were selected for this study. Indian participants were undergraduate and graduate students attending Auburn University, a primarily Caucasian, upper-middle-class institution. Indian participants were recruited via flyers and e-mails to the Auburn University Indian Student Organization. The screening criteria used to select the Indian sample were: a) 19 years or older in age, b) born in either India or United States; c) have Indian parents and grandparents who were born and raised in India; d) fluent in English; and e) spent at least a year in the U.S. American participants were recruited through undergraduate psychology courses as well as via e-mails to other departments on campus (mainly engineering) in order to maintain equivalence between the two cultural groups. The criteria to belong in the American sample were: a) 19 years or older in age, b) born in United States, c) have American parents and grandparents who were born and raised in the United States, and d) be fluent in English.

Participants were offered extra credit (if applicable) or an opportunity to enter a raffle to win $50 in cash for participating in the study.

Design

This study employed a 2x3 design; two cultural groups were compared at three levels of slide valences (positive, neutral, and negative) to investigate potential influence of culture on the experience and expression of emotion.

Stimuli

The stimuli used in this experiment were twenty-six color pictures slides selected from the International Affective Picture System (IAPS) developed by Lang and his associates (1988). The IAPS was developed to provide a set of normative emotional stimuli for experimental investigations of emotion and attention. IAPS elicits a wide variety of affective reactions and is a well-validated method to assess affective behavior across multiple response systems i.e., behavioral, verbal, and physiological. IAPS adopts the conceptualization of emotion as a behavioral complex situated in a three dimensional affective space (Lang, Bradley & Cuthbert, 2001). These three dimensions of are valence (pleasant to unpleasant), arousal (excited to calm), and dominance (controlled to in control) (Lang, Bradley & Cuthbert, 2001). The IAPS includes over 800 stimuli (color pictures on a CD). For each picture, there are ratings of affective valence (ranging from pleasant to unpleasant), arousal (ranging from calm to excited) and dominance (or control).

Forty pretest slides (12 positive, 16 neutral, and 12 negative) were selected from the pool of 800 slides based on the mean ratings of valence, arousal, and dominance for all subjects (male and female) provided in the manual (Lang et. al, 2001). Based on a pilot test with these 40 slides, 26 slides (6 positive, 14 neutral, and 6 negative) were chosen for the current study. The slides were selected for consistency in physiological

arousal, mean rating of valence, arousal, and dominance. Participants in the pilot study were three women and two men from each cultural sample, totaling ten. Stimuli that failed to elicit consistent physiological arousal in all three categories, positive, negative, and neutral or stimuli that generated ceiling or floor effects were rejected. More neutral slides were selected in comparison to positive or negative slides because neutral slides were also used as fillers between the other two categories.

Measures and Apparatus

E-Prime Studio and Photoshop: The presentation of stimulus slides for this experiment was created using E-Prime software, the standard psychological software for computer experiments. Stimuli were presented full-screen on a 14-inch monitor. Participants were seated approximately 25 inches away from the screen. Each picture was sized to fit the computer monitor at 760 x 480 pixels. Altogether, there were 13 blocks (3 positive, 3 negative, and 7 neutral). Each block consisted of 2 positive slides or 2 neutral slides or 2 negative slides. Positive and negative blocks were both preceded and followed by a neutral block. Each timed slide was presented for 30 seconds, followed by a set of questions.

First, participants were presented with a list of feeling words and asked to choose the feeling word that fit or was closest to the way they felt after viewing the slide. The feelings list was adopted from the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The participants were asked to type the letter that corresponded to the feeling word. Once they selected their feeling, a second question appeared. Participants were asked to rate on a scale of 0 to 9 (0 being not at all and 9 being extremely) how strongly they felt the feeling they selected after viewing the slide.

The three scales that followed were the Self-Assessment Manikin (SAM) (Lang & Bradley, 1994). Participants rated each slide on the dimensions of pleasure (happy-unhappy), arousal (excited-calm), and dominance (controlled – in control) using a keyboard. A computer version of the Self Assessment Manikin (SAM) was created using PhotoShop tools. The ratings of valence on the SAM are indicated by five graphic depictions of the manikin with facial expressions ranging from a severe frown (most negative) to a broad smile (most positive). Arousal and dominance were similarly measured; for arousal, the manikin varies from low to high agitation and for dominance, the manikin varies from very small to very large dominance.

The experiment lasted anywhere between 32-35 minutes. The slides were presented in the same order to all participants.

Physiological Recording

Participants were connected to Criticare Systems instrumentation so that physiological measures can be obtained continuously throughout the session. The Criticare System was used to monitor pulse, temperature, and respiration. A non-intrusive finger device was placed on an index finger of a non-dominant hand of the participants. The heart rate was monitored while the participants viewed the stimuli slides. The heart rate was recorded in a computer using CRESS plowshare software. The first four minutes of the recording was used as a baseline of the heart rate for each participant.

Questionnaires

Demographic Questionnaire

Participants were asked to fill out a brief demographic questionnaire. This questionnaire asked for age, sex, race, year in school, major area of study, place of birth,

number of years lived in the US, both parents' ethnicity, place of birth and residence, grandparents' place of birth and residence, and participant's first language or mother language. The questionnaire also asked participants to rate their English language fluency and their current general health: 1= Excellent, 2= Good, 3= Fair, 4= Poor. This demographic questionnaire was used as a screener for this study.

The Toronto Alexithymia Scale (TAS-20; Bagby, Parker, & Taylor, 1988)

The TAS-20 measures the three facets of alexithymia: a) difficulty identifying feelings and distinguishing them from bodily sensations (ID) b) difficulty communicating or describing emotions to others (COM) and c) an externally oriented style of thinking (EXT). Items are answered using a 5-point scale to indicate the extent to which the respondent agrees with each statement. The TAS-20 has been found to have modest internal consistency (0.81), test-retest reliability (0.77), and good convergent and discriminant validity. In addition, the three-factor structure of alexithymia has been found to be replicable across different cultural groups, including samples in the United States and in Asia.

Somatization (SOM; Derogatis, 1994)

This variable was measured using the 12-item somatization subscale of the Symptom Checklist 90 –Revised (SCL-90-R; Derogatis, 1994). Participants rated the extent to which each item had bothered or distressed them during the preceding few weeks. The subscales of the SCL-90-R have demonstrated high internal consistency (.77 to .90), one-week test-retest reliability (.78 to .90) and generated adequate evidence supporting its concurrent, convergent, discriminant, and construct validity (Derogatis, 1994).

The positive and negative affect schedule (PANAS; Watson, Clark, & Tellegen, 1988)

The PANAS was used to measure emotional experiences. Participants rated each of 20 emotions on how frequently they had felt each emotion "within the past few weeks" on a 5-point scale. The alpha coefficient for positive affect (PA) and negative affect (NA) is reported in the range of .86 to .90 and .84 to .87, respectively.

The satisfaction with life scales (SLS; Diener, Emmons, Larsen, & Griffin, 1985)

The SWLS consists of five statements that relate to global life satisfaction to which participants respond on a seven-point scale (1= strongly disagree to 7= strongly agree). Diener et al. (1985) have reported evidence of discriminant and convergent validity for the SWLS, and high internal consistency (0.87).

Self-construal scale (SCS; Singelis, 1994)

The Self-Construal Scale measures interdependent and independent self-construal. It has 12 interdependent items and 12 independent items. Each item is rated on a 7-point scale with answers ranging from 1 (strongly disagree) to 7 (strongly agree). Scores are calculated separately for independent and interdependent self-construal. Singelis reported a coefficient alpha of .74 for the Interdependence subscale and .70 for the Independence subscale.

Collective self-esteem scale (CSES; Luhtanen & Crocker, 1992)

The collective self –esteem scale (Luhtanen & Crocker, 1992) has 16 items and 4 subscales. The Membership Esteem subscale measures the extent to which an individual feels that s/he is a worthy member of the groups to which he or she belongs. The Public Collective Self-Esteem subscale reflects one's judgment of how others evaluate his or her social groups. The Private Collective Self-Esteem subscale assess one's personal

judgments of how good one's social groups are. The Identity subscale measures the importance of group membership to one's self-definition. Each item is rated on a 7-point scale that ranges from 1 (strongly disagree) to 7 (strongly agree). Luhtanen and Crocker reported a coefficient alpha of .85 for the overall scale, and internal consistencies of the subscales ranged from .71 to .88.

General Ethnicity Questionnaire (GEQ; Tsai, Ying, & Lee, 2000)

The GEQ measures cultural orientation and allows for independent assessments of orientation to American culture. It assesses cultural orientation in specific life domains including social affiliation, activities, attitudes, exposure, and language. Participants rate 38 items on a 5-point Likert scale ranging from 1 (very much) to 5 (not at all). This measure has internal consistency (.87). The GEQ-Indian was adapted from the GEQ to measure the cultural orientation of the Indian sample to the Indian culture.

Procedure

Each participant came to the laboratory and signed the informed consent form. They then completed the demographic questionnaire, which was also used as a screening questionnaire. If the participants did not meet the inclusion criteria, he or she was thanked and awarded extra credit as promised. Data from the Indian sample was collected first, once the Indian sample collection was completed American participants were recruited from the psychology courses as well as other departments such as the engineering and business in order to maintain equivalence between groups in terms of age, number of years in school and major areas of study. For both samples, the order of the computer or the questionnaire phase was counterbalanced. The questionnaires in the packet were presented in the same order for all participants.

For the computer phase, each participant received oral instructions for the task, which were repeated on the computer monitor at the beginning of the tasks. The participants were connected to the physiological measure as they read the directions for the computer phase. Presentations of the stimuli were contingent upon a keystroke by the participant. The first two slides presented were used as a practice session where the scales were explained to the participants by the experimenter. Once the participants had an understanding of the task the directions for the experimental session were presented on the screen at which point the experimenter left the room in order to avoid an experimenter effect. All participants completed the experiment within one hour.

III. RESULTS

Demographic Characteristics

Sixty participants (30 Indian and 30 US) met the inclusion criteria and completed the study during a single semester at a Southeastern university. Both cultural groups consisted of equal numbers of men and women (15). The mean age of the Indian respondents was 23.33 (*SD* = 2.928, ranging from 19 to 30). The mean age of the US respondents was 22.77 (*SD* = 2.956, ranging from 19 to30). The racial make-up of the Indian group was 100% Indian. Although the participants were from different regions of India, the majority of participants were from the Southern India. The racial make-up of the U.S group was 100% Caucasian, thus maintaining the cultural homogeneity of the groups. The mean number of years in college was 5.23 (*SD* = 1.675, ranging from 1st year of college to 4th year of graduate school) for the Indian group and 4.47(*SD* = 1.978, ranging from 1st year of college to 5th year of graduate school) for the U.S group. The major areas of study were divided into the natural sciences (e.g., engineering, computer science, biology, etc.) and the social sciences (e.g., business, psychology, sociology, etc.). All the participants in both groups were single. For the Indian group the mean number of years in the US was 5.27 (*SD* = 6.736, ranging from 1 to 25). In order to check for the level of acculturation, the Indian group was divided into two groups based on the number of years lived in the US. Indians who lived in the US for 3 years or more were categorized as acculturated, the Indians who lived in the U.S. for less than 3 years were

categorized as less acculturated. The cutoff of 3 years was arbitrarily selected to divide the Indian group equally. The acculturated group consisted of 15 participants (5 men and 10 women) and the less acculturated group consisted of 15 participants (10 men and 5 women).

This experiment was designed to test for group differences between Indian participants and American participants in the physiological and subjective response to emotion eliciting stimuli. To examine whether there were any group differences in the physiological responses, we conducted a multivariate analysis of variance (MANOVA) by group on mean heart rate during the 13 blocks of slide presentation. The main multivariate effect of group was not significant, *Wilks's $\lambda = 0.832$, $F (13, 46) = 0.712$, $p = 0.742$*. The mean heart rates for each block including a practice block are shown in Figure 1.

Analyses of the mean heart rate across the slide valences were also conducted by aggregating the data from the corresponding blocks for the three valences (positive, neutral, negative). Again, no significant difference was observed between the groups for the three valence types *Wilks's $\lambda = 0.954$, $F (2, 57) = 1.367$, $p = 0.263$*. The mean heart rate for the three valence types for the two comparison groups is shown in Figure 2.

Next, an analysis of the data was conducted to compare the difference in the subjective ratings of the slides between the two comparison groups. Group x Valence MANOVA using mean positive and negative affective ratings showed no significant main effect *Wilks's $\lambda=0.912$, $F (2,57) = 2.736$, $p=0.073$*. More neutral than positive slides were rated positively by both cultural groups. Positive and Negative affective ratings for each valence type are presented in Figure 3 and Figure 4, respectively.

The intensity of the affective ratings were similarly analyzed, there was a significant group effect, *Wilks's λ= 0.865, F (2, 57) = 4.461, p = 0.016*. For all three valences, Indian participants endorsed the affective rating at a higher level than their U.S. counterparts did. The mean intensity rating for the two groups on the three slide valences is shown in Figure 5.

Following the analyses of the subjective ratings and the intensity of those ratings, the SAM measures were analyzed between the groups across the three valences. The groups did not differ significantly on the pleasure scale (Happy vs. Unhappy), *F (2, 57) = 1.091, p=0.343*. However, the two groups differed on the arousal scale (Excited vs. Calm), *F (2, 57) = 6.604, p=0.003*, and the dominance scale (Controlled vs. In-Control), *F (2, 57) = 3.332, p = 0.043*. The US participants reported feeling more calm while viewing the positive and the neutral slides than their Indian counterparts did; however, the Indian participants reported feeling more calm while viewing the negative slides compared to the US participants. Similarly, the US participants reported feeling more in control while viewing the positive and the neutral slides than their Indian counterparts did, and once again, the Indian participants reported being more in control when viewing the negative slides than their US counterparts. The mean ratings for the three SAM scales are presented in Figure 6, Figure 7 and Figure 8, respectively.

Questionnaire Data

To investigate other variables that may influence the expression and experience of emotion between the two cultural groups the questionnaire data exploring individuals' self-construal, collective self-esteem, satisfaction with life, positive and negative affect, somatization, alexithymia, and general ethnicity were analyzed. An independent samples

t-test procedure conducted on the total score of SCS, CSES, SLS, PANAS, SCL, and TAS revealed no significant differences between the two groups. The means and the standard deviations for the scales for the two cultural groups are presented on Table 1. There was a significant difference on the GEQ scale, *t(58) = 5.910, p=0.00*. The analysis of the Interdependent and Independent subscale of the SCS revealed a significant difference between the two groups on the Interdependent subscale, *t(58) = -3.140, p=0.003*, with the US reporting higher interdependence. In addition, the subscale analysis of the PANAS scale revealed a significant difference between the two groups in their report of positive affect *t(58) = 2.526, p=0.014*. The Indian participants reported more positive affect than their US counterparts.

To test the interscale correlations between the measures of alexithymia, satisfaction with life, positive and negative affect and self-construal for the two cultural groups, Pearson (r) correlations were calculated, as shown in Table 2 and Table 3 respectively. There was a significant correlation between alexithymia and negative affect in both cultural groups; however there was no significant association between positive affect and alexithymia. This finding is consistent with the hypothesis that negative affect is associated with higher level of alexithymia. Positive affect did not correlate with satisfaction with life for both cultural groups but there was a significant negative correlation between negative affect and satisfaction with life for the US group. For both cultural groups, independent subscale of self-construal correlated positively with the total alexithymia score. In addition, the interdependent self-construal negatively correlated with alexithymia score for the US group. This finding does not support the hypothesis

that interdependent self-construal is associated with high levels of alexithymia we observed the contrast.

Acculturation

To measure the influence of acculturation within the Indian group, independent sample t-tests were conducted on the total scores of the SCS, CSES, SLS, PANAS, SCL, and TAS. There were no significant differences between the acculturation groups. The only significant difference was observed between the two groups on the GEQ scale, t (28) = 2.342, p=0.034. The less acculturated Indian participants scored higher on this scale. Individual item analyses of the questionnaires revealed some significant group differences, for example, on the TAS, the less acculturated group strongly endorsed "I prefer to watch 'light' entertainment shows than psychological dramas" and "I can feel close to someone, even in my moments of silence." The less acculturated group reported being more inspired, determined, cooperative in the social group, and thinking their life as close to ideal than their more acculturated counterparts. On the other hand, the acculturated Indian participants strongly endorsed items such as, "I would offer my seat in a bus to my professor", "I will stay in a group if they need me, even when I'm not happy with the group", and "I am the same person at home that I am at school."

Gender

A gender comparison across the entire sample was conducted by collapsing the two cultural groups on the measures of SCS, CSES, SLS, PANAS, SCL, GEQ, and TAS. There was no significant difference between the genders on any of the total scale scores. However, individual item analyses did reveal some gender differences. For example, women were more likely than men to endorse faintness and dizziness on the SCL, and

men more likely than women to endorse preference to watch 'light' entertainment shows than psychological dramas. Women rated "distressed" higher than men on the PANAS. There were also some gender differences on the GEQ items. Men rated "I was raised in way that was Indian/ American" higher than women. Women scored higher on "I perform Indian/American dance." On the self-construal scale men rated higher on "It is important to me to respect decisions made by the group" than the women.

Within-group gender comparisons were also conducted for each cultural group. There were no significant differences between genders in the US sample on any item. Individual item analyses revealed some gender differences among the Indian participants. On the TAS scale Indian women reported that they have physical sensations that "even doctor's don't understand" and feelings they "can't quite understand." Men reported preferring to talk to people about their daily activities rather than their feelings. Women rated their personal identities independent of others as very important; where as men rated their lives as close to their ideal and "excellent." Men also rated "alert" and "attentive" on the PANAS higher than women. Individual item analyses of the GEQ revealed that the Indian men endorsed items such as "I was raised in ways that was Indian" and "I am familiar with Indian cultural practices and customs" highly, indicating higher social/cultural identity. In contrast, Indian women endorsed items suggesting a practice of their culture reflected in items such as "I perform Indian dance", "I speak Indian language at school" and "I speak Indian language with friends."

IV. DISCUSSION

As predicted, the results support the hypothesis that there is no physiological difference in the experience of emotion between the two cultural groups; however, the intensity of the reported experience is different. Counterintuitively, the Indians reported experiencing emotions more intensely than their US counterparts. Although, the direction of this finding was not expected it was consistent with the self-construal endorsed by the participants from two cultures. The US participants reported higher interdependent self-construal and lower intensity of experienced emotion. We expected to find a difference in physiological response across the three slide valences, i.e., decreased heart rate while viewing negative slides, but this result was not obtained. The lack of differences in physiological responses across valences may be attributed to the relatively insensitive measures of physiological reactions used. In addition, the slides with positive and negative valences may not have adequately generated physiological reactions. The slides were pre-selected to minimize a ceiling effect such that the emotional arousal does not taint other subjective ratings of the slide. It is possible that the slides selected for the positive and negative groups in the present study (most of which were related to experience of positive or negative life events) did not elicit strong physiological reactions. Studies in the past have used more emotionally evocative slides such as erotic pictures, mutilation, violence, etc. (Bradley, Codispoti, Sabatinelli, & Lang, 2001).

Consistent with this explanation, both cultural groups rated neutral slides more positively than the positive slides. This did not occur in pretest. Nature scenes and household items were selected as neutral slides. Perhaps the nature scenes were relaxing and thus positive in comparison to the positive slides, which included scenes of positive life events. Visually pleasing slides may be more positive than slides requiring positive emotional relatedness. In addition, the duration of the slide presentation (30 seconds) may have resulted in boredom. On the subjective rating of the slides, the Indian participants reported a higher level of control and calm when responding to the negative slides than U.S. participants. This difference may be attributed to the possibility of exposure and experience with negative life events either in their own lives or exposure to it on the media.

The current study findings are consistent with past research indicating that greater cultural differences are found in reports of subjective emotional experience and measure of expressive behavior than in measures of physiological responding (Drummond & Quah, 2001; Friesen, 1972; Levenson et al., 1992; Tsai & Levenson, 1997, Le et al, 2002). Self-reports of emotional experience and expressive behavior may be more influenced by cultural models of emotion as they are more detectable by others (Tsai and Levenson, 1997; Boesch & Tomasello, 1998; Le et al, 2002). Previous studies have also demonstrated that cultural differences in emotional responses tend to occur more in social than nonsocial contexts (Tsai et al., 2000; Lazarus et al., 1966; Ekman, 1972). Researchers have failed to obtain group differences in reported emotional experience or expressive behavior between Japanese and American male adults while they watched distressing film clip in a room alone. In contrast, in studies where there was a continual

exchange between experimenter and participant, between participants, or when participants were observed by others cultural differences were obtained with East Asians exhibiting less emotion than their Western counterparts (Le et al., 2002).

Interestingly, in the present study the US students reported being more interdependent than the Indian students. This finding may attest to the cultural and attitudinal difference in the South compared to other regions of the US. Cross- cultural research findings have identified the US as the prototypical individualist culture on the individualism-collectivism dimension (Hofstede, 1980; Triandis, 1994). However, Vandello and Cohen (1999) contend that given the diversity within the nation, different regions of the US show measurable variation on the individualism-collectivism dimension. They studied the intranation variation in order to understand the individualism-collectivism dimension in general and found the Deep South to be the most collectivist region of the country. A parallel intranation continuum may be present within the Indian culture. The Indians sampled were mostly from South India, which is anecdotally more subject to western cultural influence than other regions of India as a consequence of Christianity and western values accrued largely because of their experience with the British colonial rule. Furthermore, the Indians sampled were students who had been in the US for at least a year; this in itself may reflect an independent quality further enhanced by their experience in the US. Triandis (1994) hypothesized that affluence will be associated with individualism and argued that financial independence leads to social independence. Also, emotional expression is linked to the relative emphasis culture places on individuals' social goals (Kitayama, Markus, & Kurokawa, 2001; Markus & Kitayama, 1991; Mesquita, 2001). For the Indian participants it is important to adjust to Western culture

and adopt Western values to achieve desired social goals. Most of the Indian participants were single and therefore, did not have to make adjustments to the needs of others. Western culture encourages expression of emotion in order to achieve personal goals, which may be viewed by Indians as vital for their success in the academic world (as all participants were students and majority were students in the professional fields). The Indian participants "out-individualized" their US counterparts in this study.

One purpose of the current study was to replicate the findings of Le et al. (2002). They found that higher levels of alexithymia were associated with higher levels of negative affect and lower levels of positive affect and life satisfaction among all cultural groups. Also, participants from the Eastern cultural groups were associated with higher levels of alexithymia than participants from Western cultural groups. The current study attempted to replicate Le et. al's results with a different cultural group; Indians. But, only partial support was obtained. For both cultural groups (Indians and US) there was a significant correlation between negative affect and alexithymia. Higher levels of negative affect were associated with higher levels of alexithymia. Satisfaction with life was not associated with affect or alexithymia for the Indian group; however, it was for the US group. In addition, independent self-construal was positively associated with alexithymia and interdependent self-construal was negatively associated with alexithymia. This finding is inconsistent with other research findings, but it is a first study to explore the relationship between self-construal and alexithymia directly. Past studies, including Le et al's study have used culture as an explanatory independent variable, which is too general. Cross and Madson (1997) have asserted that individuals with different self -construal pursue divergent goals in social situations and self-construal influences the information

that is understood to be important. Therefore, individuals with different self-construals may attend to different emotional cues. According to Cross and Madson (1997) individuals with an independent self-construal base their self-esteem on their feelings of separateness and autonomy and are reluctant to express emotions that indicate interdependence or that threaten their sense of self-reliance and autonomy. Conversely, individuals with an interdependent self-construal appear more willing to express their emotions because sharing them can facilitate the intimate relationships they strive for (Cross & Madson, 1997). This is one logical explanation for the association of alexithymia and self-construal. A second explanation could be the nature of the instruments, as equivalent words or sentences in meaning and form are sometimes very difficult to obtain.

In the current study there was a significant difference between groups on the ethnicity questionnaire (GEQ). This difference was expected as this questionnaire addresses the ethnicity of each cultural group. Within-group differences were also observed on this questionnaire. Men in both cultural groups reported higher levels of social or cultural identity whereas women reported higher levels of cultural practices. This difference in gender can be attributed to gender-stereotypic socialization in cultural context (Fischer, Mosquera, van Vianen & Manstead, 2004). Also, less acculturated Indians reported higher scores on this questionnaire perhaps indicating a less assimilation to the host culture. Farver, Narang, and Bhadha (2002) have asserted that the integrative approach to acculturation, i.e., individuals becoming bicultural by maintaining characteristics of their own ethnic group while selectively acquiring those of the host country, may be the most psychologically adaptive strategy. The Indians sampled in this study demonstrated

individualistic values, which enhance their achievement of personal and social goals while at the same time minimizing problematic personal identification and social alienation (Farver, Narang, & Bhadha, 2002).

Limitations and Future Directions

It is possible that we found few differences in emotional responding because the stimuli did not elicit emotional responding powerfully enough. Each method of eliciting emotion in the laboratory involves sizable trade-offs. We chose the IAPS, which is a set of standardized affect eliciting visual stimuli and provides a high level of experimental control. This is the first study of its kind to use the IAPS to measure cultural influence between groups. Future studies might employ the same method but vary the arousal intensity of the slides as well as the number and duration of the slides presented. Others in the field have used emotion-evoking techniques such as that of reliving emotions, making emotion-specific facial expression, film clips, interview etc. to measure the difference in emotional responding. Our understanding of how culture shapes emotional responding may require studies that incorporate a judicious mix of tasks that elicit emotional responses. Including additional dimensions such as sound might increase the emotional impact of the slides.

The present findings on self-assessed alexithymia and self-construal suggest a relationship between the two constructs; however, the cause of that relationship has yet to be determined. Alexithymia is a clinical construct and the present study was conducted on a "normal" student sample. The nature of the relationship between these two variables in a clinical sample remains untested.

The limitations of this study are related to the small sample size, which limits generalizability of findings. Both Indians and US participants of this study live in the US and are influenced by the US cultural context, which in general emphasizes individualist values. The sampling of college students, needless to say, is also a limitation. This sample may not be representative of the general population of Indian and American residents. A better cultural comparison might involve the comparison of two groups of individuals in their original cultural settings.

It is clear that further research is needed to provide more insight into the extent to which gender differences in emotions vary with gender roles. Although there is no theoretical consensus explaining this phenomenon, several investigators have suggested that differences in emotional expression are related to social expectations based on different gender roles (Cross & Madson, 1997). It would be interesting to explore the concept of acculturation to different cultures, both Eastern and Western, to examine the directionality of experience and expression of emotion. For this purpose, a longitudinal study may be appropriate. An interesting sample may constitute of individuals from the individualist cultures who study or volunteer in a collectivist cultures, for example Peace Corps volunteers or study abroad students or vice versa, such as foreign students who study in the US.

In conclusion, the current study contributes to our knowledge and understanding of cross-cultural experience and expression of emotion and underscores the utility of emotions as a means of responding and adapting to the given environment or culture to attain social and personal goals. The acculturation process may be accompanied by the changes in the way emotion is experienced as a form of adaptation to the host culture's

values and norms. These findings may have important interpersonal implication in both clinical and non-clinical settings. Interpretations based solely on cultural identity may be misleading as people are motivated to adapt to their host culture rapidly. Future research on the processes of acculturation is needed to fully understand how individuals manage cultural transitions and the psychological factors that underlie them. Clearly, the links between culture and emotions are more complex than the current literature acknowledges.

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Figure1.

Mean heart rate across the blocks

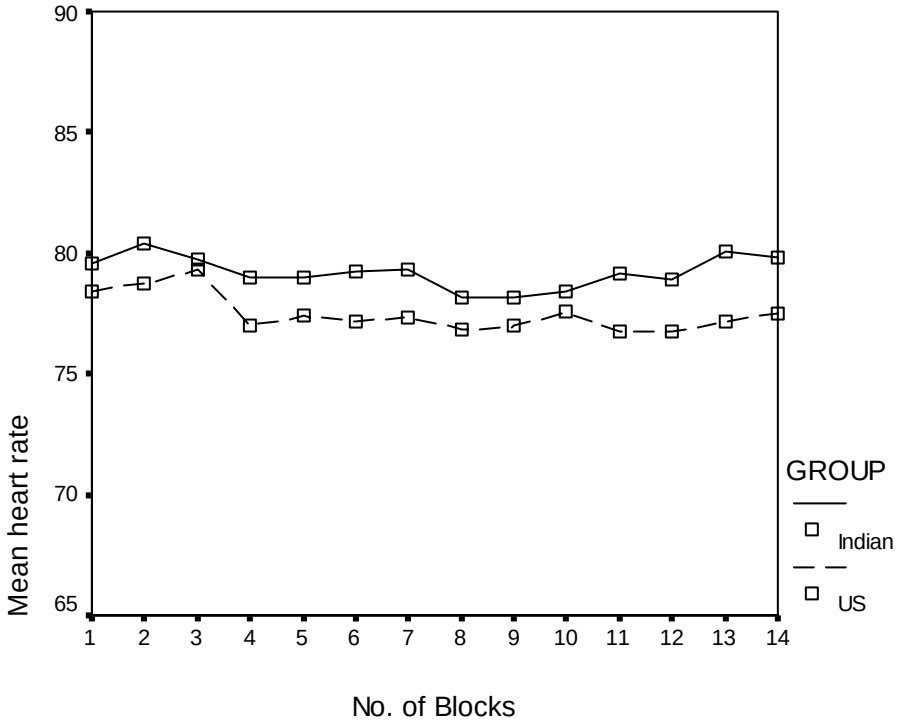

Figure 2.

Mean heart rate across slide valence

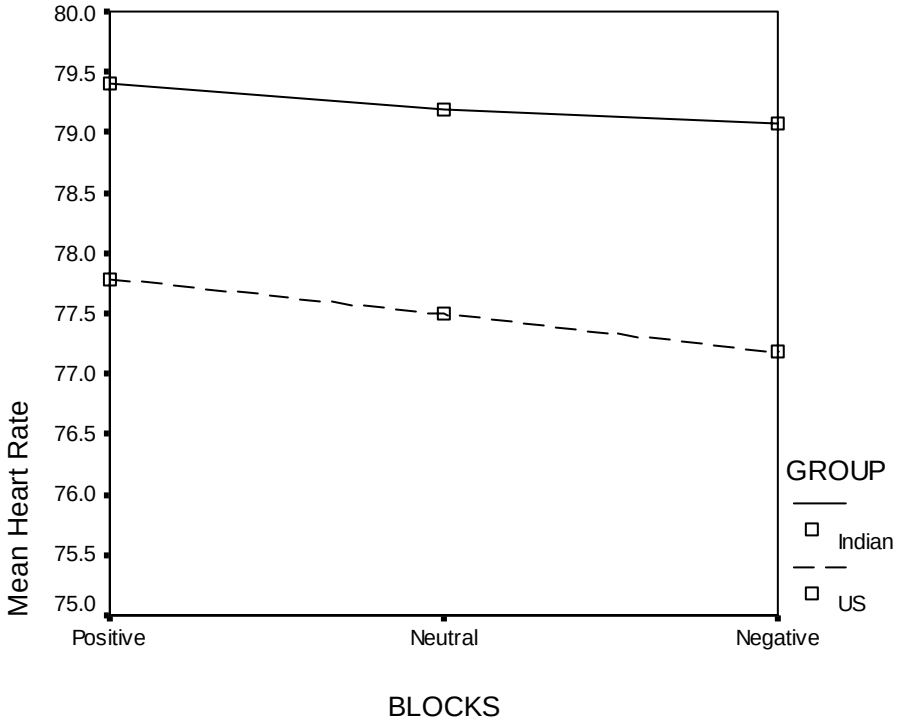

Figure 3.

Positive affect rating and slide valence

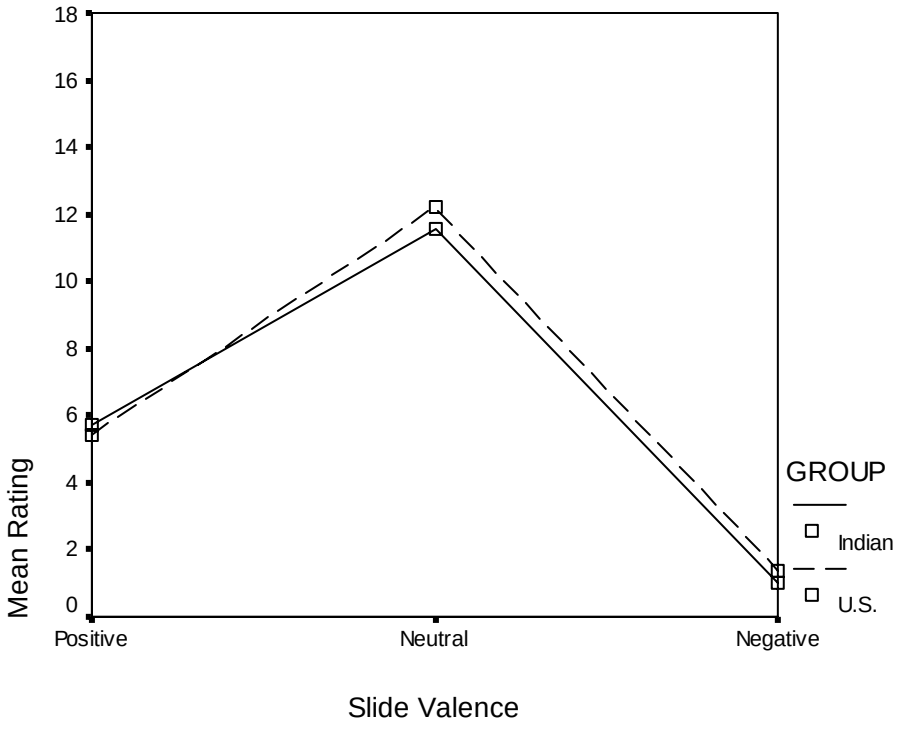

Figure 4.

Negative affect rating and slide valence

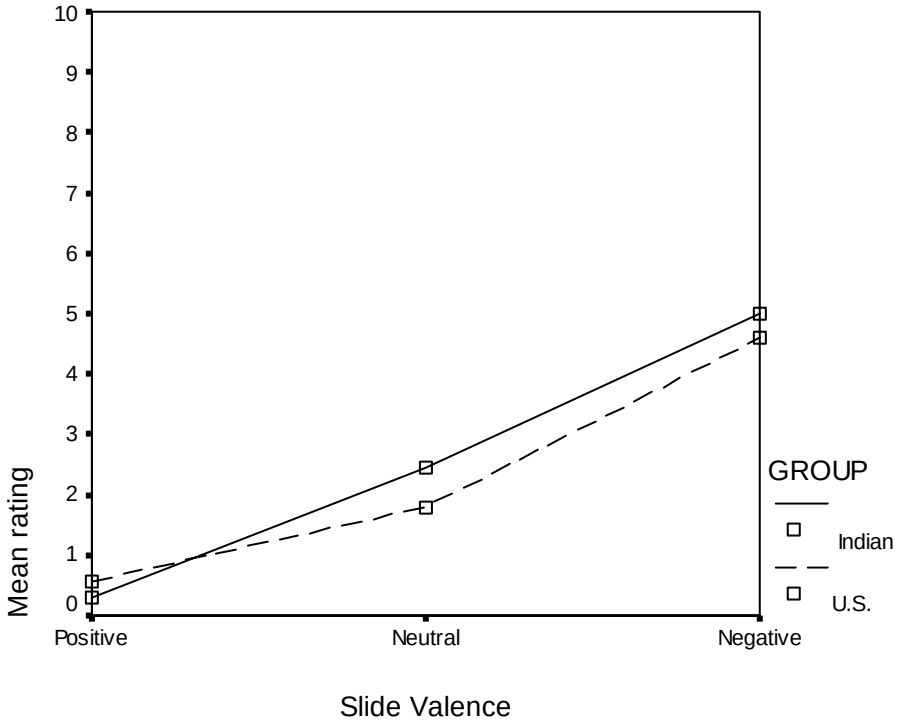

Figure 5.

Intensity rating and slide valence

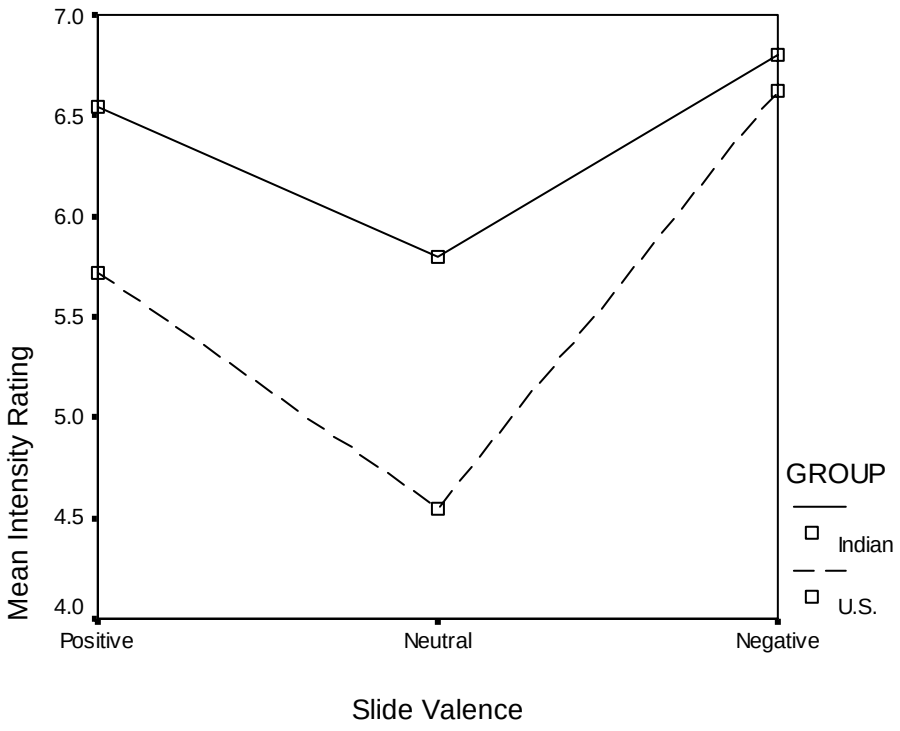

Figure 6.

Mean ratings on pleasure scale

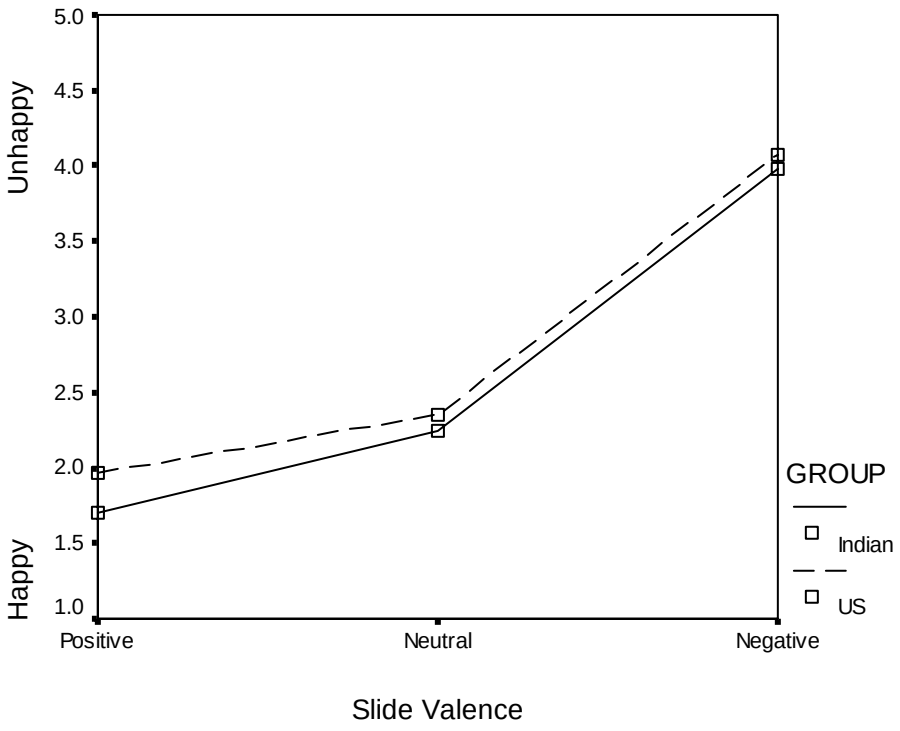

Figure 7.

Mean ratings on arousal scale

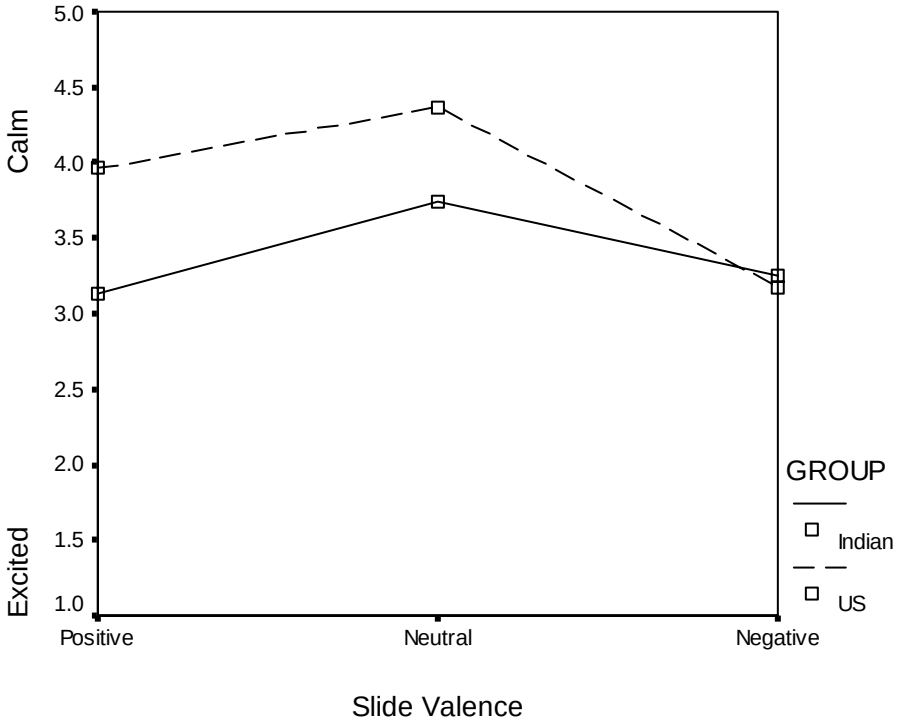

Figure 8.

Mean ratings on dominance scale

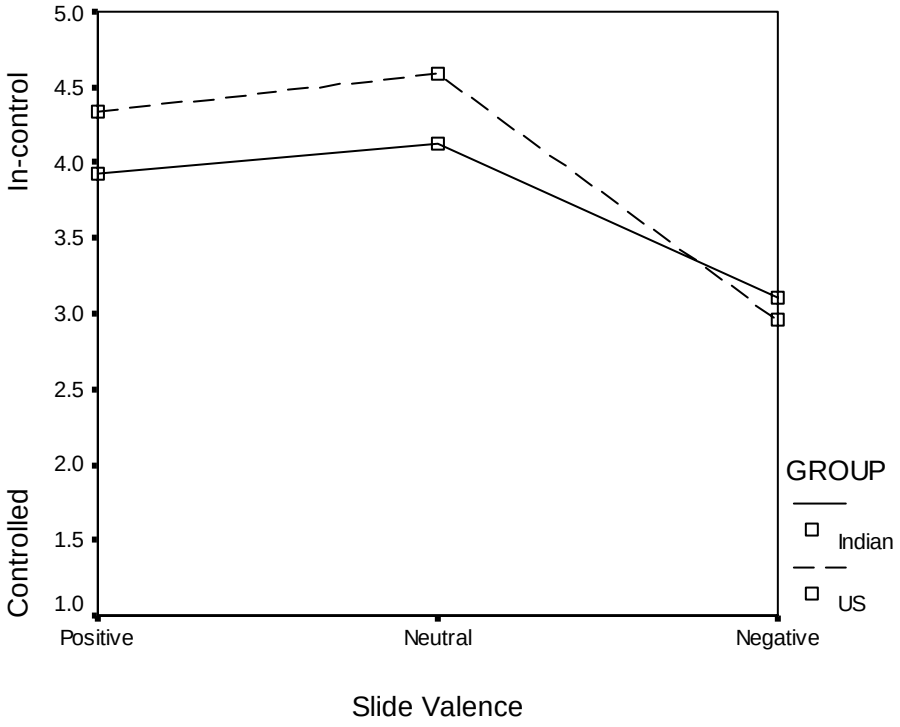

Table 1

Means and Standard Deviations for the questionnaire variables for Indian and US Samples

	Mean		Standard deviation	
Group	Indian	US	Indian	US
TAS Total	53.57	52.53	7.07	8.06
SCL Total	3.80	5.87	3.47	6.70
CSES Total	66.63	66.00	4.97	4.29
SLS Total	23.33	24.40	6.07	6.17
GEQ Total*	133.33	117.77	11.96	8.76
PANAS Total	60.30	57.30	8.48	8.75
PANAS Positive**	39.76	36.46	5.30	4.79
PANAS Negative	20.53	20.83	7.00	7.32
SCS Total	66.63	71.27	9.55	13.15
SCS Interdependent**	30.73	37.23	7.51	8.48
SCS Independent	35.90	34.03	6.76	10.18

Note. * $p < .01$
** $p < .05$

Table 2

Interscale Correlations for Indian group (n=30)

	TAS Total	SLS Total	PANAS Total	PANAS Positive	PANAS Negative	SCS Total	SCS Independent
TAS Total							
SLS Total	.021						
PANAS Total	.335	-.210					
PANAS Positive	-.045	-.256	.559**				
PANAS Negative	.437*	-.059	.781**	-.081			
SCS Total	.213	-.090	-.059	-.270	.132		
SCS Independent	.479**	.235	-.039	-.342	.211	.623**	
SCS Interdependent	-.161	-.326	-.040	-.034	-.022	.710**	-016

Note. ** $p < .01$
* $p < .05$

Table 3

Interscale Correlations for US group (n=30)

	TAS Total	SLS Total	PANAS Total	PANAS Positive	PANAS Negative	SCS Total	SCS Independent
TAS Total							
SLS Total	-.434*						
PANAS Total	.420*	-.178					
PANAS Positive	-.020	.306	.549**				
PANAS Negative	.516**	-.414*	.837**	.001			
SCS Total	.041	-.057	-.021	-.512**	.310		
SCS Independent	.372*	-.440*	.121	-.540**	.499**	.764**	
SCS Interdependent	-.383*	.439*	-.178	-.145	-.118	.633**	-.109

Note. ** $p < .01$
* $p < .05$