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**FACTORS AFFECTING SUSCEPTIBILITY TO EMOTIONAL CONTAGION
AMONG SOUTH INDIAN HINDUS RESIDING IN INDIA**

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Abstract

Scholars have long been interested in the process of emotional contagion. It is said to aid in the functions of facilitating social interaction, promoting interpersonal trust, and defining boundaries for social transgressions such as indicating appropriate and inappropriate behaviors within groups. Research on emotional contagion has examined the impact of various factors such as gender, self-construal, and familial relationships, on Americans' susceptibility to emotional contagion. Unfortunately, scholars have spent little effort determining whether or not the process of emotional contagion exists, or operates in the same way in cultures outside of America – specifically South Asian cultures. They have not, for example, investigated how cultural traits – such as individuals' self-construal – might affect susceptibility to emotional contagion in traditional cultures such as India. This study examines the link between gender, family composition, urbanization, and self-construal and the susceptibility to emotional contagion among Hindu college students residing in the South Indian state of Andhra Pradesh. Specifically, the study examines links between the aforementioned variables and the respondents' scores on the Emotional Contagion (EC) scale, including the five subscales of the EC scale. Results indicate that gender and self-construal are significantly associated with participants' scores on the overall emotional contagion scale, and on some of its subscales. Limitations, implications, and directions for future research are discussed.

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Factors Affecting Susceptibility to Emotional Contagion Among South Indian Hindus Residing in India

Introduction

Emotional contagion, people's tendency to “catch” others’ emotional states, has been a well-researched phenomenon (Doherty, 1994, 1999; Hatfield, Cacioppo & Rapson, 1992, 1994; Larson & Almeida, 1999). On a superficial level, emotional contagion may seem to be synonymous with empathy. However, several researchers to date have made distinctions between emotional contagion and empathy. Generally, empathy has been described as requiring three distinct skills: the cognitive ability to understand the situation from another person’s perspective, the ability to feel what the other person is feeling, and the intention to aid the person in distress (Decety & Jackson, 2004; Hatfield, Rapson & Le, in press). From this description, it is apparent that while emotional contagion is a subset of empathy and is required for empathy (Decety & Jackson, 2004), the two processes are not synonymous.

According to scholars, emotional contagion serves a social function. It appears to be a primitive form of communication, which facilitates social interactions (Anderson, Keltner & John, 2003) and helps promote interpersonal trust and reconciliations following social norm transgressions (Keltner, 1995). If emotional contagion is indeed a facilitator of social interaction, one prediction would be that in highly collectivistic societies, individuals would be especially susceptible to emotional contagion due to the heavy emphasis on group harmony

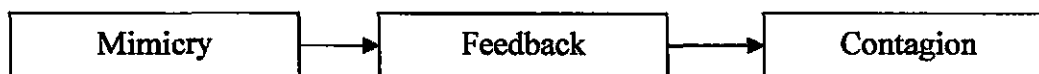
and social norms. One way to study these inter-related concepts is by examining if there is a difference in the susceptibility to emotional contagion among people who construe themselves in terms of others around them and among people who construe themselves as being unique from others. Thus, examining the self-construal of individuals in a highly collectivistic society such as India should reveal whether the emphasis on group harmony and social norms has a significant effect on their susceptibility to emotional contagion.

The purpose of this study was to select Western constructs such as emotional contagion and self construal, and examine whether these constructs reveal consistent effects in the Indian culture, and also to examine the effects of gender, family composition, urbanization and self-construal on the multidimensional and uni-dimensional construct of emotional contagion. Research on gender, family, and culture, in the context of emotional contagion, research on self-construal and research conducted in India on Indian populations will be examined before the research questions and hypotheses are stated and results are discussed.

Emotional Contagion

Hatfield, Cacioppo, and Rapson (1994) define emotional contagion as “the tendency to automatically mimic and synchronize expressions, vocalizations, postures, and movements with those of another person’s, and, consequently to converge emotionally” (p. 5). This definition involves three stages of contagion.

Figure 1. Three stages of emotional contagion



Hatfield, Cacioppo, and Rapson theorized that during the first phase of emotional contagion, a person mimics the non-verbal behaviors of another person. This mimicry creates a feedback process which can lead a person to approximate what the other is feeling. This feedback ultimately leads to emotional contagion where one person catches the emotions of another and feels what the other is feeling.

Researchers have found evidence that differences in individuals' responses to the behaviors of others and the context in which the behavior occurs are both reliable cues to how susceptible to contagion that individual will be (Laird et al., 1994). Laird and colleagues studied mimicry and feedback and their relation to susceptibility, and found that individuals whose experiences were influenced by self-produced cues tended to mimic others' cues and were more susceptible to emotional contagion than were their peers (cited in Anderson, Keltner & John, 2003). However, Laird's research does not provide support for the five conditions theorized by Hatfield, Cacioppo and Rapson (1994); there is currently little evidence to conclusively support some of the five conditions described in the next section. Research by Doherty (1993) also provides evidence to support the validity of the Emotional Contagion scale as an accurate measure of the three stages of contagion with correlations to the three stages between 0.25 and 0.30, p

< 0.05.

According to the theory put forth by Hatfield, Cacioppo and Rapson (1994), the susceptibility to emotional contagion may be higher for: (1) those whose attention is directed on others rather than on self, (2) those who possess interdependent self-construals rather than independent self-construals, (3) those who are aware of others' gestures and postures, (4) those who tend to mimic others' gestures and postures, and, (5) those who are more emotionally responsive or reactive (p. 148). Thus, according to this theory, people who perceive themselves in light of others rather than in a unique, solitary fashion are more likely to be more susceptible to emotional contagion.

The susceptibility to emotional contagion is measured by the Emotional Contagion scale (Doherty, 1997; See Appendix A). This measure consists of 15 items which assess susceptibility on five different factors: Love, Anger, Happiness, Fear and Sadness. Overall internal consistency for the scale has been found to be high (Cronbach's alpha = 0.90). Within the subscales, the internal consistency for the positive emotion factors subscales was satisfactory (Cronbach's alpha = 0.80) and the internal consistency for the negative emotion factors subscales was also satisfactory (Cronbach's alpha = 0.82). Test-retest reliability scores demonstrated reasonably high reliability (Cronbach's alpha = 0.84).

Research on Gender and Emotional Contagion

Based on the original theoretical model proposed by Hatfield, Cacioppo,

and Rapson (1994), consistent gender effects have been reported in research on emotional contagion. Women in general, seem to be more susceptible to emotional contagion than are men. More specifically, women tend to score higher on the emotional contagion scale subscales of love, sadness, joy and also in their general sensitivity. Men score higher on the anger subscale. Researchers also found that male and female physicians were equally susceptible to the fear of their patients (Doherty, Orimoto, Singelis, Hatfield & Hebb, 1995).

Family and Emotional Contagion

Studies of emotional contagion among families in the United States also has some evidence revealing trends of higher susceptibility to emotional contagion among family members. Research has found that similarity of affect among family members may be partly attributed to emotional contagion, particularly between daughters and both parents, and from fathers to sons (Larson & Richards, 1994). However, this study showed no significant effects between mothers and sons. White's (1999) study of emotional contagion among mothers, fathers, and young children found that parents' affect was related significantly to marital quality and children's affect for mothers and fathers was related to their feelings toward the parent of the opposite sex. Furthermore, individuals' depressed mood was found to be related to their romantic partners feeling less positive and more negative about their relationship (Goodman & Shippy, 2002; Hatfield, Cacioppo & Rapson, 1994; Thompson & Bolger, 1999).

Cross-Cultural Research on Emotional Contagion

Cross-cultural research that has been conducted on non-Indian cultures on the susceptibility of emotional contagion has revealed inconclusive evidence for factors which affect a person's susceptibility to emotional contagion. Several researchers studying cases of epidemic hysteria in Montana Hills, Malaysia, East Africa, and Singapore concluded that emotional contagion was the cause of mass hysteria epidemics (Hatfield, Cacioppo & Rapson, 1994). These cases were not psychological studies however, and they were examined after the outbreak of hysteria. No alternative explanations were offered for the contagion of hysteria among these populations. Other cross-cultural studies have tried to test the validity of the Emotional Contagion Scale (Doherty 1997) in various cultures. A study by Lunidqvist (2006) validated the use of the Emotional Contagion Scale in Swedish populations. Research on emotional contagion, has not been conducted extensively in Asian cultures, specifically India, however. With a population of over a billion and growing, and with increasing rates of migration, psychological research on Indian populations has long lasting social and clinical implications (Kallampally, 2005). Therefore this study examines factors affecting the susceptibility to emotional contagion among South Indian Hindu college students.

One of the conditions that Hatfield, Cacioppo and Rapson proposed is that an interdependent self-construal is supposed to increase a person's susceptibility to emotional contagion. We will now review the construct of self-construal and describe any evidence linking emotional contagion to self-construal.

Self-Construal

As previously mentioned, Hatfield, Cacioppo and Rapson (1994) theorized that individuals with interdependent self-construals would be more susceptible to emotional contagion than would be individuals with independent self-construals. Currently there is some evidence to support this hypothesis. Markus and Kitayama (1991) have posited that an individual with an independent self-construal would value independence and uniqueness, and would strive to exclude others from self, and an individual with an interdependent self-construal would value conformity and group harmony, and would strive to assimilate others to self (van Baaren, Maddux, Chartrand, de Bouter & van Knippenburg, 2003). Singelis and Brown (1995) proposed that no individual is uniquely independent or interdependent; independent and interdependent self-construals can co-exist in individuals to varying degrees. This assertion contradicts previous theories that the two constructs are mutually exclusive to each other. They also argued that self-construal may play a major role in understanding culture's influence on behavior (Singelis & Brown, 1995).

A person's self-construal is measured by the Self-Construal scale, developed by Singelis (1995). This measure is used to assess independent and interdependent self-construals. The self-construal scale contains 30 item Likert-type scale with end-points 1 = Strongly Disagree and 5 = Strongly Agree. It measures both the independent and the interdependent self-construals in two 15-item subscales through different factors such as group identification, harmony and loyalty. The scale is used to calculate two scores for each participant, one

independent self-construal score and one interdependent self-construal score. The self-construal scale has demonstrated satisfactory reliability and validity for both the independent (Cronbach's alpha = 0.69) and interdependent (Cronbach's alpha = 0.70) sub-scales. (Singelis, 1994).

Self-Construal and Emotional Contagion

Using the constructs developed by Markus and Kitayama (1991), Singelis (1995) found evidence that within the United States, people who are more interdependent were more susceptible to emotional contagion. However, Singelis found no significant relationships between independence and emotional contagion. Research on mimicry within the United States has also found that individuals with interdependent self-construals exhibited higher levels of facial mimicry than individuals with independent self-construals (van Baaren, Maddux, Chartrand, de Bouter & van Knippenburg, 2003). Independent and interdependent self-construals have also been studied in Indian populations (Matsumoto, 1999). Research has found that Americans perceived themselves as more dissimilar to each other and Indian participants perceived themselves as more similar to each other than did their American members (Markus & Kitayama, 1991; Matsumoto, 1999). However, as Matsumoto (1999) points out, there is a problem in assuming that differences can be attributed to differences in self-construal. It could be the case that the Indian participants identified with each other to a greater degree merely because of their immigrant status. It could also be the case that while the Americans perceived themselves as dissimilar to other Americans, the Indian

population tested was already a pre-existing subset brought together by the identifying variable of being “Indian”. Research to date has not tested a direct link between self-construal and susceptibility to emotional contagion in Indian populations residing in India.

To understand the collectivistic nature of the Indian culture, it is essential to understand some of its history which has led to the current patterns of development and change within the society. Thus, a very brief history of post-independence India will now be described. Once the major events of modern Indian history have been highlighted, the importance of a family in the Indian culture will be detailed and its significance to current research will be discussed.

Introduction to India

India is a federal democracy made up of 28 states, (all of which vary in size, population, and, natural resources), and seven union territories. Throughout the 1970s, under the leadership of the Prime Minister Mrs. Indira Gandhi, several radical socialist policies were undertaken leading to a state of corruption, a declaration of state of emergency and ultimately an election which removed Mrs. Gandhi from her position. She returned to power in 1980 with a more liberalized policy. However, the 1980s was still a period of political unrest with little growth in the GDP. The balance-of-payments crisis that put India’s debt at over one billion U.S. dollars was a turning point for Indian economic policy. In the 1990s under pressure from the International Monetary Fund and the World Bank the economy was opened up to foreign trade stabilizing the Indian GDP at around

seven percent.

The 1990s also saw the rise of India's information technology (IT) industry, telecommunications industry and satellite television, all of which have grown to be among the biggest globalizing influences on the Indian population. Development in these sectors have led to the creation of new employment opportunities for Indians, have led to the emergence of a new consumer middle-class, and have rapidly aided in urbanizing and transforming several small towns into major metropolitan cities, drastically affecting the culture and lifestyle of these areas.

Today, about 75 percent of urban families have access to local television and 50 percent have access to satellite television; about 30 percent of rural families have access to local television and about 10 percent have access to satellite television. These numbers gain significance when one considers that about 70 percent of the Indian population still lives in rural areas with limited resources.

The new consumer middle-class that has been created has been largely due to the upward mobility of the poorer classes. The disadvantage of the development of IT and India's increasing ties to the West is the rapidly growing disparities in the already uneven distribution of wealth between the urban and the rural in terms of the resources, culture, and lifestyle; the rich are getting richer, and while the poor may be getting richer, it is at a much slower pace. Rural inhabitants with resources and opportunities are increasingly migrating to urban

areas to gain access to higher wages, better opportunities, bright lights, and the freedom of the city lifestyle. Those who are unable to move to urban areas are moving close by creating transitional towns which are neither urban nor rural in nature.

This type of uneven development raises important questions about the future of India. What are the psychological implications of the culture and lifestyle changes occurring at various levels of urbanization? Will the transition from a traditional rural lifestyle to the lifestyle of the city fundamentally change the culture, lifestyle, behaviors and traditions of the people involved? These questions have not been scientifically examined yet. With the current trends of globalization, and, especially with India's growing ties with the rest of the world, the social, political and economic implications of studying India become apparent as it becomes increasingly important to gain an understanding of different segments of the Indian society (Henderson, 2002; Patel, 2004).

Family Dynamics of Indians

Thus far, research on Indians has focused on familial relationships and has been largely sociological or anthropological. Most Indians grow up in extended families, with members of the family ensuring that the group functions as a cohesive and cooperating unit (Nath & Craig, 1999). This notion of a "joint" family involves the idea that even if members of a family don't reside in the same location, they are still considered a household if they are functionally, ritually and emotionally joined (Desai, 1964; Henderson, 2002). There also seems to be a

clearly defined hierarchy according to age and sex, with older individuals and men being higher on the hierarchy than younger individuals or women. Women are the primary socializing agent in the family. Men are usually aloof (Henderson, 2002; Patel, 2004). Generally, within the joint family system, it is common to have parents living with married sons, their wives, and children and any unmarried children. If married sons do establish their own household and move away from their parents, usually, at least one son and his family continue to live with the parents (Patel, 2004).

A review of the literature reveals two distinct kinship models in India, each model localized to either Northern India or Southern India (Dyson & Moore, 1983). It is important for us to note here that this study is not based on the two kinship models described by Dyson and Moore (1983). These models are being presented merely to question their validity in present day Indian society. These models are excellent examples of the need for more updated scientific research in the Indian culture. We argue that because of the increasing trend of mobility towards urban areas, it may be more illuminating to examine Indian society in terms of differences in its urbanization rather than a North and South Indian dichotomy.

The Northern Indian family and kinship model as described by Dyson and Moore (1983) has three characteristics which make it unique from the Southern Indian model. In the Northern Indian kinship model, the spouses are usually unrelated in kinship and are usually from a different place of birth or residence.

Therefore, marriages are exogamous. Furthermore, North Indian marriages are also usually arranged for the purpose of inter-group alliances to improve the male family's and the female family's status in society. As a consequence of this, most Northern Indian women usually have very limited freedom of choice in choosing their mates, or rejecting the ones chosen for them. Because the bride is moving to a new location into the groom's household with no previous relationships established, the marriage is usually a major rearrangement of the bride's social position within the new family. As a consequence, at marriage there may be rearrangements in other social positions and relationships within the family. Therefore, the bride is generally considered a threat to the family dynamics. The bride consequently has difficulty establishing affective ties with members of her husband's household. Because the bride is brought up by her parents with the knowledge that she is someone else's property and that the parents are just trustees, affective ties between natal kin are also minimally established.

Within South Indian kinship systems, the family dynamics are significantly different. First, the marriages are usually endogamous. The ideal marriage is between cross-cousins. Due to this, women are likely to be married to known persons, in familiar households, near to their natal home. This allows for the female to have more freedom of choice compared to the North Indian bride. Because women are married to known individuals who usually reside close to the bride's natal family, women in South Indian families interact with both their natal kin and their husband's kin on a regular basis, both before and after marriage. The

marriage is not considered a major rearrangement of the bride's social position as the bride would already have established affective ties with her natal kin and her husband's kin.

This information suggests that family patterns and dynamics of North and South India have been distinctive and stable over time. However, this may not be entirely accurate as the family patterns may be shifting as a consequence of time and increased mobility due to improved technology, job opportunities and general globalization processes. There has been no recent research to examine the stability of the trends that Dyson and Moore (1983) found.

Therefore, it may be more accurate to study regional differences within Northern and within Southern India using features such as the urbanization characteristics of different places, rather than to generalize patterns across regions as a whole. While India, as a whole, may generally be a relatively collectivist nation, within that broad paradigm, self-construal as a function of family dynamics has never been explored. Furthermore, within South Indian family systems, the relationship between self-construal and various psychological processes such as emotional contagion have not been explored to date.

Purpose of Study

This study examines factors affecting emotional contagion among South Indian Hindus based on family density, geographic location, self-construal, and other demographic variables. One purpose of this study is to use Western constructs such as self-construal and emotional contagion and examine whether

we secure the same pattern of relationships in Indian and Western cultures. A second purpose of this study is to examine the effects of gender, family composition, urbanization and self-construal on a multidimensional and unidimensional construct of emotional contagion by using the overall Emotional Contagion scale and its subscales in analyses. Research in this area has far reaching implications. In addition to adding to the general body of knowledge about emotional contagion and potentially providing evidence of a direct association between individuals' self-construal and their susceptibility to emotional contagion, this research also has the potential of aiding clinicians practicing in the newly established Family Therapy program in India. The purpose of this study is to answer the following questions and test the following hypotheses:

Hypothesis One: In general, Indian women will report greater susceptibility to emotional contagion than will Indian men. Specifically, women will score higher on the emotional contagion scale than will men.

As we discussed earlier, women are the primary agents of socialization in an Indian family. If this is indeed true, and women are supposed to be especially sensitive to emotional contagion, then it seems reasonable to propose that a group of women with a child in their care would have a greater influence on the child than would a single socialization agent.

Hypothesis Two: Participants in families with a higher percentage of women will report greater susceptibility to emotional contagion than will

participants in families with a lower percentage of women. Specifically, participants in families with a higher percentage of women will score higher on the emotional contagion scale as compared to participants in families with a lower percentage of women.

Question One: Does the percentage of women in the family have a greater impact on participants of one gender than the other?

There is no previous research to allow for the formulation of a directional hypothesis to test this question. This question is being posed for exploratory purposes.

How does participants' geographical location influence their susceptibility to emotional contagion? We propose the following:

Hypothesis Three: In general, participants in urban locations will report lower susceptibility to emotional contagion than will their rural peers. Specifically, participants who live in urban locations will score lower on the Emotional Contagion scale than will be those from rural areas.

How does the participants' self-construal affect their susceptibility to emotional contagion? To answer this question, the following hypotheses will be tested:

Hypothesis Four: In general, participants who construe themselves as more independent will report less susceptibility to emotional contagion than participants who construe themselves as more interdependent.

Hypothesis Five: In general, participants who construe themselves

as more interdependent will report greater susceptibility to emotional contagion than participants who construe themselves as independent.

Question Two: Do geographic location and self-construal interact in shaping susceptibility to Emotional Contagion. The kinship models described by Dyson and Moore (1983) identify two very distinct systems based on a person's geographical location. The first system was the North Indian kinship model which was characterized by exogamous marriages with limited freedom of choice for the bride and a rearrangement of the bride's social relationships and interactions after marriage. The second system was the South Indian kinship model which was characterized by endogamous cross-cousin marriages, a greater freedom of choice for the bride and minimal rearrangement of the bride's social relationships and interactions after marriage. Earlier, we also discussed the trend of increased mobility through out India. If geographic locations are an important factor in the social and emotional interactions of a person, it seems reasonable to propose that individuals' self-construals will interact with the geographic locations they live in, shaping their susceptibility to emotional contagion. Currently there is no research to support a directional hypothesis. This question is being posed for exploratory purposes.

Thus far, research on Indian families has been limited to Hindus, who comprise anywhere between 70 to 85 percent of the population in India (Patel, 2004). It is unknown whether models of family systems of Indians from other religions differ due to religious history, customs and tradition. Thus, in this study

we propose to analyze data for the Hindu sample only. Data from individuals of other religions will be collected, and the data will be analyzed separately in future research.

Method

Participants

Approximately 700 Asian Indian adults (over the age of 18) who currently reside in India were recruited by random sampling from various colleges and universities from the South Indian state of Andhra Pradesh. Due to missing data and incomplete questionnaires, several cases were dropped from the analysis, resulting in 478 participants. Of the 478 participants, 79 were excluded from the final analysis because they reported their religious affiliation to be non-Hindu, resulting in a sample of 399 participants. Once the 399 Hindu participants were isolated from the data set, participants with missing information in any part of the data including the demographics, and any measures were excluded resulting in 325 participants whose information was used in the final analysis. All participants were between the ages of 18 and 21, therefore their ages were not recorded.

Measures

Demographics

Participants were asked to report their personal demographic information such as gender, religious affiliation, the number of people in their family, and the number of women in their family. Data on religious affiliation was collected for exclusion purposes. The analysis of data for the purposes of this study was

conducted only on those participants who identified themselves as Hindu. This was done in order to ensure a more homogeneous sample for the purposes of data analysis. Therefore participants who identified themselves as non-Hindu were excluded from the current study. However, these data will be subject to separate analysis at a later time. Of the 325 participants, 40.0 percent ($n = 130$) were female and 60.0 percent ($n = 195$) were male; 46.2 percent ($n = 150$) of the participants lived in urban areas and 53.9 percent ($n = 175$) lived in non-urban areas.

Emotional Contagion

Participants were then asked to complete the Emotional Contagion Scale (Doherty, 1997) to assess individuals' susceptibility to emotional contagion (See Appendix A), with higher scores reflecting greater susceptibility to emotional contagion. The Emotional Contagion scale contains 15 items which assess susceptibility on five different factors: Love, Anger, Happiness, Fear and Sadness. Overall internal consistency for the scale has been found to be high (Cronbach's $\alpha = 0.90$). Within the subscales, the internal consistency for the positive emotion factors subscales was satisfactory (Cronbach's $\alpha = 0.80$) and the internal consistency for the negative emotion factors subscales was also satisfactory (Cronbach's $\alpha = 0.82$). Test-retest reliability scores demonstrated reasonably high reliability (Cronbach's $\alpha = 0.84$). Research by Doherty (1993) provides evidence to support the validity of the Emotional Contagion scale as an accurate measure of the three stages of contagion with correlations to the three

stages between 0.25 and 0.30, $p < 0.05$. For the current study, the overall internal consistency of the Emotional contagion scale was found to be somewhat satisfactory (Cronbach's alpha = 0.68) with the internal consistency of the subscales ranging from 0.52 to 0.59.

Self-Construal

Participants were also asked to complete the Singelis Self-Construal Scale (Singelis, 1994; See Appendix B) to assess independent and interdependent self-construals. The self-construal scale contains 30 item Likert-type scale with endpoints 1 = Strongly Disagree and 5 = Strongly Agree. It measures both the independent and the interdependent self-construals in two 15-item subscales through different factors such as group identification, harmony and loyalty. The scale is used to calculate two scores for each participant, one independent self-construal score and one interdependent self-construal score. The self-construal scale has demonstrated satisfactory reliability and validity for both the independent (Cronbach's alpha = 0.69) and interdependent (Cronbach's alpha = 0.70) sub-scales. (Singelis, 1994). For the current study the internal consistency was found to be somewhat satisfactory for both the independent (Cronbach's alpha = 0.62) and interdependent (Cronbach's alpha = 0.58) subscales.

Procedure

Participants were administered the questionnaires in a classroom setting at the various colleges and Universities in India. Participants first received an informed consent form which they were asked to read and retain for their records

after which they were asked to complete the questionnaires. The informed consent form and all questionnaires were available to the participants in English, and Telugu – the state language. At the completion of the questionnaires, participants were orally debriefed and were asked to contact the researcher in case of questions.

Statistical Analyses

First a principal component analysis was conducted on the emotional contagion scale. The analysis was to examine whether the factor loadings are similar for Western and non-Western samples, and ensured construct validity of the scale in the Indian population. Table 6 (p. 23) reports the factor structure and inter-factor correlations for the Emotional Contagion Scale for this sample. A principal component analysis was also conducted on the self-construal scale. The analysis was to ensure construct validity for the self-construal scale. Table 8 (p. 30) reports the factor structure and the inter-factor correlations for the Self-Construal Scale for this sample. A correlational analysis of all predictors was also conducted to check for multicollinearity between predictors.

Once the results of the factor analysis and the correlational analysis were revealed, the variables gender, urbanization, percentage of women in the family, independence and interdependence and all possible interaction effects were regressed onto the overall emotional contagion scale and its subscales. The variables percentage of women in the family, independence, and interdependence were continuous variables. The variable urbanization had two levels – urban and

non-urban.

Based on the results of the overall regression model, post-hoc analyses were conducted on any significant effects in the regression model. This was done in order to conduct hypothesis testing, and also in order to enable us to interpret the significant results.

Results

The first step was to attempt to determine if two of the major measures used – the Emotional Contagion scale and the Self-Construal scale – possessed the same factor structure in the Indian sample as these scales were found to possess in American samples. In order to find out, we first conducted a Principal Components Analysis on the Emotional Contagion scale.

Emotional Contagion Scale:

Principal Components Analysis on the Emotional Contagion Scale with Promax rotation revealed factor loadings inconsistent from the factor analysis conducted on the Emotional Contagion scale in the original study (Table 1, original data not shown).

Table 1

Factor Structure Correlations for the Emotional Contagion Scale.

	Factor1	Factor2	Factor3	Factor4	Factor5
If someone I'm talking with begins to cry, I get teary-eyed.			0.56		
Being with a happy person picks me up when I'm feeling down.	0.42		0.52		
When someone smiles warmly at me, I smile back and feel warm inside.				0.59	
I get filled with sorrow when people talk about the death of their loved ones.			0.55		
I clench my jaws and my shoulders get tight when I see the angry faces on the news.					0.54
When I look into the eyes of the one I love, my mind is filled with thoughts of romance.	0.76				
It irritates me to be around angry people.				0.73	
Watching the fearful faces of victims on the news makes me try to imagine how they might be feeling.					0.77
I melt when the one I love holds me close.	0.75				
I tense when overhearing an angry quarrel.		0.62			
Being around happy people fills my mind with happy thoughts.			0.73		
I sense my body responding when the one I love touches me.	0.72				
I notice myself getting tense when I'm around people who are stressed out.		0.47			
I cry at sad movies.		0.67			
Listening to the shrill screams of a terrified child in a dentist's waiting room makes me feel nervous.		0.68			

Note. All factor correlations under 0.40 have been deleted for clarity.

While the results of the factor analysis accounted for 53.08 percent of the variance in the sample for the overall emotional contagion scale, the factor structure for four of the five individual factors was different from that reported in the original study (Doherty, 1997). The love subscale did have a factor structure that was consistent with the original data. Thus, all subsequent analyses were conducted on the overall emotional contagion scale and the love subscale. The other four subscales – happiness, anger, sadness and fear – were dropped from subsequent analyses.

This analysis also revealed that internal consistency for the overall scale was satisfactory with Cronbach's $\alpha = 0.68$ and internal consistency for the love subscale was also slightly satisfactory with Cronbach's $\alpha = 0.60$.

The next step was to attempt to determine if the Singelis' measure of Self-Construal possessed the same factor structure in the Indian sample as the scale was found to possess in American samples. In order to find out, we conducted a Principal Components Analysis on the Self-Construal scale.

Self Construal Scale:

Principal Components Analysis on the Self-Construal Scale using Promax

Rotation revealed a factor structure that was drastically different from the original factor structure as purported by Singelis (1994). Results revealed 11 factors with eigenvalues greater than one, with one factor with an eigenvalue greater than three and two factors with eigenvalues greater than two. Due to the inconsistency of the results, the Self-Construal Scale and all hypotheses and questions relating

to it were dropped from subsequent analyses.

Once the factor analysis results were revealed, the predictors were then correlated with each other to check for multicollinearity. Results revealed that that gender was strongly negatively correlated to the percentage of women in the family and the urbanization variables. Within this sample, men were more likely to be in families with a lower percentage of women ($r = -0.60, p < 0.0001$) and men were also more likely to live in urban areas ($r = -0.25, p < 0.0001$). Furthermore, the percentage of women in the family variable was weakly positively correlated with the urbanization variable. Within this sample, participants living in more non-urban areas were more likely to have a higher percentage of women in their families ($r = 0.11, p = 0.04$).

Hypotheses Testing

Therefore results revealed a satisfactory overall Emotional contagion scale that did not have the same factor structure for the Indian sample as it does for American samples. Results also revealed an unsatisfactory factor structure for the Self-Construal scale and its two subscales which resulted in the measure being dropped from further analyses. Once the factor structures were examined, the Emotional Contagion scale and the love subscale were used to test the hypotheses previously proposed. In order to test the hypotheses, the regression analysis model used was as follows:

$$\text{Emotional Contagion} = a + b_1 (\text{Gender}) + b_2 (\text{Urbanization}) + b_3 (\text{Percentage of women in the family}) + b_4 (\text{Gender*Urbanization}) + b_5 (\text{Gender *}$$

Percentage of women in the family) + b_6 (Urbanization * Percentage of women in the family) + b_7 (Gender*Urbanization*Percentage of women in the family). (1)

Love = $a + b_1$ (Gender) + b_2 (Urbanization) + b_3 (Percentage of women in the family) + b_4 (Gender*Urbanization) + b_5 (Gender * Percentage of women in the family) + b_6 (Urbanization * Percentage of women in the family) + b_7 (Gender*Urbanization*Percentage of women in the family). (2)

Once the overall regression models were run, each non-significant interaction was systematically dropped from the regression model to form a more parsimonious model for both the overall emotional contagion scale and the love subscale. The effect size of the results was weak as the overall regression model explained only 2.9 percent of the variance ($R^2 = 0.029$) for the overall emotional contagion scale and 6.3 percent of the variance ($R^2 = 0.063$) for the love subscale.

Results revealed that none of the two-way interactions or the three-way interaction between gender, urbanization, and percentage of women in the family had any significant effects on the overall model with the overall Emotional Contagion scale. As a result, the non-significant variables were dropped from the model to form a more parsimonious model:

$$\text{Emotional Contagion} = a + b_1 (\text{Gender}). \quad (3)$$

$$\text{Love} = a + b_1 (\text{Gender}). \quad (4)$$

While the model accounts for a lower percentage of the overall variance for the overall emotional contagion scale ($R^2 = 0.016$) and the love subscale ($R^2 =$

0.039), the parsimonious model was found to be much stronger in significance.

The resulting model with beta-weights was as follows:

$$\text{Emotional Contagion} = 43.88 - 1.53 (\text{Gender}), (t = -2.28, p = 0.02) \quad (5)$$

$$\text{Love} = 8.78 + 0.89 (\text{Gender}), (t = 3.59, p = 0.0004) \quad (6)$$

Results from the parsimonious regression model indicated that gender, is the only variable in this study which has a significant effect on a person's susceptibility to emotional contagion. Based on these results, after dropping self-construal from the design, post-hoc analyses were run for the significant main effect of gender.

Hypothesis One

Hypothesis one proposed that in general, Indian women will report greater susceptibility to emotional contagion than will Indian men. Specifically, Indian women will score higher on the Emotional Contagion scale as compared to Indian men.

The results of the parsimonious regression model revealed that women tended to be more susceptible to emotional contagion than are men. Post-hoc analysis of the gender variable revealed that women tended to score an average of 1.53 points higher on the Emotional Contagion scale; women scored at the least 0.21 points and at the most 2.85 points higher than men on the overall Emotional Contagion scale.

The results of the parsimonious model also revealed that men scored higher on the love subscale than women. Post-hoc analysis on love subscale revealed that on average men scored higher than women by 0.89 points on the

love subscale. Men tended to score at least 0.40 points and at most 1.37 points higher than women on the love subscale.

In summary, hypothesis one stated that women will score higher on the Emotional Contagion scale as compared to men. When we looked at the results we found that hypothesis one had been supported by the evidence presented here, for the overall Emotional Contagion scale. Indian women in this sample did score higher on the Emotional Contagion scale as compared to men. However, when we looked at the love subscale of the Emotional Contagion scale, we found that the evidence did not completely support previous research. As mentioned before, previous research in the West found evidence to support that women score higher on the love subscale. Our results indicated that in the Indian sample, men scored higher than women on the love subscale, contradicting previous research.

Hypothesis Two

Hypothesis two stated that participants in families with a higher percentage of women will report greater susceptibility to emotional contagion than will participants in families with a lower percentage of women. Specifically, participants in families with a higher percentage of women will score higher on the Emotional Contagion scale as compared to participants in families with a lower percentage of women. The percentage of women in the family did not have a significant effect on the overall Emotional Contagion scale or the love subscale in the overall regression model. Therefore this variable was dropped from subsequent analyses.

In conclusion, our results indicated that the percentage of women in the family does not have a significant effect on the susceptibility to emotional contagion.

Research Question One

Research Question one was designed to explore the possible interaction between gender and the percentage of females in the family on the dependent variables. In research question one, we asked whether the percentage of women in the family influences participants of one gender more than the other. The interaction effect of gender and percentage of females in the family did not have a significant effect on the overall emotional contagion scale or the love subscale. Therefore this interaction variable was dropped from all subsequent analyses.

In conclusion, our results indicated that the interaction of gender and the percentage of women in the family did not have a significant effect on the susceptibility to emotional contagion.

Hypothesis Three

Hypothesis Three stated that in general, participants in urban locations will report lower susceptibility to emotional contagion than will their rural peers. Specifically, participants who live in urban locations will score lower on the Emotional Contagion scale than participants who live in rural areas. Hypothesis three concerned the effect of urbanization on the dependent variables. The urbanization variable did not have a significant effect on the dependent variables in the overall regression model, and hence it was dropped from all subsequent

analyses.

In conclusion, our results indicated that there was no evidence to support the hypothesis that the geographical location of the participants has a significant effect on their susceptibility to emotional contagion.

Hypotheses four and five and research question were related to the Self-Constraint scale. Since the factor analysis of the Self-Constraint scale was inconsistent, the two hypotheses and the research question were dropped from the design and no analyses pertaining to this measure were conducted.

Discussion

Cross-cultural theorists have long insisted on the importance of cross-cultural research. As countries become increasingly diverse and international contacts become common due to increased networking in economical, political and emotional realms, psychologists can no longer assume an acultural or a unicultural stance (Segall, Lonner & Berry, 1998). After the emergence of cross-cultural psychology as a field, Berry and Dasen (1974) identified three crucial goals that they hoped cross-cultural psychology would accomplish: (1) to test our current psychological knowledge and perspective in other cultures; (2) to discover new aspects of the constructs being studied in terms of meaningful local cultural terms and (3) to use the first two goals to integrate findings into a more universal psychology. (Segall et al., 1998) In this study, we have attempted to do just that, and in part, our findings (or lack thereof) are a testament to the validity of their plea and critique. In this study, we questioned men and women from the state of

Andhra Pradesh in India about their susceptibility to Emotional Contagion and their self-construals. Our results suggest that the gender of a person had significant effects on the overall emotional contagion scale and its pre-validated love subscale. Results also revealed that the percentage of women in the family and the geographical location of the participants did not have a significant effect on either the overall emotional contagion scale or the love subscale.

One interesting finding in this study that has not been seen before in research is the significant association between gender and the percentage of women in the family, and the geographical location. Our results indicate that men are more likely to be in families with a significantly lower percentage of women and they are also more likely to be in more urban locations. One reason for the association between gender and urbanization could be that young men in rural families may be moving to cities for better opportunities in education and work, while leaving their families behind in more non-urban locations. Currently, we have no hypotheses explaining the possible association between gender and the percentage of women in the family. While it is true that for the men in the sample, their gender automatically lowers the percentage of women in the family, it may not be enough to explain the significant association between the two variables. Furthermore, a significant association was also found between urbanization and the percentage of women in the family. Our results indicate that participants from more non-urban areas have a higher percentage of women in the family. This could be due to the fact that families in more rural areas generally tend to be

larger. However, our results indicate that there was no significant association between overall family size and the percentage of women in the family.

Therefore, this leads us to believe that this association, and the associations between gender, urbanization and percentage of women in the family warrant further study.

The inconsistency of the self-construal scale posed a problem in this study that could not be overcome. It would be interesting to explore the factor structure of the Self-Construal scale to examine how the factor structure is different from American samples, and if there are any notable trends and patterns that may have contributed to a unique factor structure.

In conducting this research, we have made several discoveries. First, we found that the commonly accepted psychometric measures may not be acceptable in all cultures at all times. Second, we found that in different cultures, self-report, physiological, and behavioral measures may be of differential value. Finally, we found that the context in which different measures are administered may be of crucial value.

Lack of Measurement Invariance

The first issue concerns the lack of measurement invariance (Steenkamp & Baumgartner, 1998). Measurement invariance can be defined as “whether or not, under different conditions of observing and studying phenomena, measurement operations yield measures of the same attribute” (Horn & McArdle, 1992, p. 117). Once a factor analysis was conducted on the Emotional Contagion

scale and the Self-Construal scale it became apparent that the two measures did not possess this trait. Measurement invariance or measurement equivalence is a concept that has recently started gaining importance among researchers, as they felt the need to address circumstances which may threaten the quality of psychometric tools, but which cannot be resolved using classical approaches such as calculations or simple estimations (Vandenberg, 2002). Vandenberg (2002) describes the circumstances which require the need for measurement invariance. One of the main circumstances which necessitated the development of this concept was to answer the question: Do individuals from different cultures interpret and respond to a measure from the same frame of reference? Experts agree that the lack of measurement invariance in constructs when making comparisons between groups is of paramount importance in cross-cultural research (Little, 2000). Our study did not possess measurement invariance, as is apparent by the non-similar factor structure observed between the two scales as used in Indian samples and as established by previous American samples. This could be due to several reasons. One reason could be that the Indian sample did not have the same meanings to keywords in the statements in the two scales as the Western samples did. This could be due to the emphasis on *imposed-etic* (Ryan, Chan, Ployhart & Slade, 1999) approach that is currently prevalent in research. *Imposed-etic* research is an approach where the psychometric measure developed in one culture, and is assumed to be universal and therefore used across cultures. This study did employ an *imposed-etic* approach.

However, in the Emotional Contagion scale, some keywords may have the same meanings. Evidence for this is seen in the fact that the love subscale of the Emotional Contagion scale did translate perfectly into the Indian culture. The other subscales however, did not carry over. We must make sure that people in all cultures attribute the same cultural meanings to various keywords before complex processes such as Emotional Contagion can be studied cross-culturally.

Differential value of measures

Another reason for the lack of measurement invariance could be that Indians and Americans have differential familiarity with self-report measures. Americans may be far more experienced with the use of these measures than are South Asians.

If this factor does indeed accounts for the different patterns in these cultures, this problem can be corrected and adjusted for in future research by using a multi-method approach. Using other methods such as qualitative audio-visual scenarios, or even hypothetical scenarios on paper with visual images of certain emotions may translate more accurately across cultures. Russell (1991) argues that “an emotion category is a script with both culture-specific and pancultural components”. If it is true certain components emotions can be found stable across cultures, and can be studied scientifically, it would lend more support to the theory that the mechanisms that emotional contagion operates under is more universal and less culture driven than our data lead us to suppose. This type of research in the future would also help alleviate some of the concerns

regarding measurement equivalence, as the equivalence can be more thoroughly established through the study of the pancultural components across cultures.

The context of the testing situation

A third reason for the lack of measurement invariance could be the context in which the participants were administered the questionnaire. The participants were all young adults who were administered the questions in a classroom setting with adults present in some situations. While the participants were assured that their responses would be kept completely confidential, and no identifying information was collected, the presence of an authority figure could have skewed participants' responses to certain items.

There were also several other limitations and issues that were discovered during the course of this study. These shall now be discussed.

Relative Importance of Emotional Contagion in explaining variance

A limitation with the results is the low proportion of variance that was accounted for by the overall parsimonious model. The model in this study accounted for less than two percent of the total variance. This means that all the variables put together were not able to account for a majority of the unique variance available in the sample. There are several other variables that need to be examined with relation to emotional contagion, such as in-depth analysis of the influence of family life on an individual's susceptibility to emotional contagion, self-monitoring and even observations of behaviors through social interactions; however, future research should also be directed at isolating potential moderators

and mediators in the process. For instance, if a person's self-construal is not a good measure of their susceptibility to emotional contagion, maybe other related constructs such as masculinity and femininity could capture the variance in a better manner than employed in this study.

Context versus universality of human behavior

Another issue with the study is the more abstract issue of context versus universality of human behavior. Did the results of this study reveal the importance of contextual details or did it amplify individual differences which are assumed to be random noise in the background for universal behaviors? Cross-cultural psychology strives to understand culture by examining behaviors, attitudes and values of several cultures and finding similarities and differences between them (Segall, Lonner & Berry, 1998). Critics of cross-cultural psychology have criticized the philosophy and methodology of the field by pointing out that the instruments used do not standardize across cultures due to the differences in the meanings of the keywords. Critics have also described cross-cultural psychology as finding individual variations in what are basically universal human behaviors. However, it cannot be argued that the study of context is important, just as the study of basic human processes is.

Evolutionary biology and evolutionary psychology have provided considerable evidence that certain human behaviors such as finding a mate, disgust reflex and to some extent, emotional contagion, are universal. (van Baaren, Holland, Kawakami & van Knippenburg, 2004). However, the

mechanisms by which the behaviors are executed may differ from culture to culture. For instance, the method of finding a mate differs from culture to culture. Until very recently, arranged marriages have been the norm for finding a mate, and that is still the case in some countries like India, where the goodness of fit into the family and group harmony may be more important than individual desires. As a consequence of this cultural expectation, the majority of Indians did not date, and courtship behavior may be drastically different.

However, the processes related to mating are undergoing drastic changes in recent years because of the increase in dating behaviors and love marriages among Indians. This increase could be a consequence of greater exposure to Western lifestyles; however, there is currently little or no scientific study of these behaviors. These behaviors and traditions may not be just individual differences; they may be a result of the interaction of evolutionary needs and the cultural and environmental context that the individual is in. These processes, such as courtship behaviors, dating behaviors and marriage – especially love marriage across castes and geographical regions -- definitely warrant cross-cultural comparisons.

With the impact of globalization on cultural processes, India is going through a series of major changes leading to uneven developmental patterns and behaviors across different sectors of society. With increasing ties between India and the world due to outsourcing and due to increasing rates of immigration, it becomes increasingly important to study the similarities and differences that are manifested in basic human processes to compare and contrast cultures and

peoples (Kallampally, 2005). This will lead to a better understanding of not just the psychology of a culture but it would aid in the understanding the interactions of inherent universal human processes with the situation and the environment of the individual.

Appendix A
Emotional Contagion Scale

The Emotional Contagion Scale

This is a scale that measures a variety of feelings and behaviors in various situations. There are no right or wrong answers, so try very hard to be completely honest in your answers. Results are *completely confidential*. Read each question and indicate the answer which best applies to you. Please answer each question very carefully. Thank you.

Use the following key:

4. *Always* = Always true for me.
3. *Often* = Often true for me.
2. *Rarely* = Rarely true for me.
1. *Never* = Never true for me.

1. If someone I'm talking with begins to cry, I get teary-eyed.
 2. Being with a happy person picks me up when I'm feeling down.
 3. When someone smiles warmly at me, I smile back and feel warm inside.
 4. I get filled with sorrow when people talk about the death of their loved ones.
 5. I clench my jaws and my shoulders get tight when I see the angry faces on the news.
 6. When I look into the eyes of the one I love, my mind is filled with thoughts of romance.
 7. It irritates me to be around angry people.
 8. Watching the fearful faces of victims on the news makes me try to imagine how they might be feeling.
 9. I melt when the one I love holds me close.
 10. I tense when overhearing an angry quarrel.
 11. Being around happy people fills my mind with happy thoughts.
 12. I sense my body responding when the one I love touches me.
 13. I notice myself getting tense when I'm around people who are stressed out.
 14. I cry at sad movies.
 15. Listening to the shrill screams of a terrified child in a dentist's waiting room makes me feel nervous.
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Appendix B

The Singelis Self-Construal Scale

1 = strongly disagree

**3 = don't agree or
disagree**

4 = agree

2 = disagree

5 = strongly agree

_____ I enjoy being unique and different from others in many respects.

_____ I can talk openly with a person who I meet for the first time, even when this person is much older than I am.

_____ Even when I strongly disagree with group members, I avoid an argument.

_____ I have respect for the authority figures with whom I interact.

_____ I do my own thing, regardless of what others think.

_____ I respect people who are modest about themselves.

_____ I feel it is important for me to act as an independent person.

_____ I will sacrifice my self interest for the benefit of the group I am in.

_____ I'd rather say "No" directly, than risk being misunderstood.

_____ Having a lively imagination is important to me.

_____ I should take into consideration my parents' advice when making education/career plans.

_____ I feel my fate is intertwined with the fate of those around me.

_____ I prefer to be direct and forthright when dealing with people I've just met.

_____ I feel good when I cooperate with others.

1 = strongly disagree **3 = don't agree or disagree** **4 = agree**
2 = disagree **5 = strongly agree**

- _____ I am comfortable with being singled out for praise or rewards.
- _____ If my brother or sister fails, I feel responsible.
- _____ I often have the feeling that my relationships with others are more important than my own accomplishments.
- _____ Speaking up during a class (or a meeting) is not a problem for me.
- _____ I would offer my seat in a bus to my professor (or my boss).
- _____ I act the same way no matter who I am with.
- _____ My happiness depends on the happiness of those around me.
- _____ I value being in good health above everything.
- _____ I will stay in a group if they need me, even when I am not happy with the group.
- _____ I try to do what is best for me, regardless of how that might affect others.
- _____ Being able to take care of myself is a primary concern for me.
- _____ It is important to me to respect decisions made by the group.
- _____ My personal identity, independent of others, is very important to me.
- _____ It is important for me to maintain harmony within my group.
- _____ I act the same way at home that I do at school (or work).
- _____ I usually go along with what others want to do, even when I would rather do something different.

Appendix C
The Informed Consent Form

**Agreement to Participate in
Emotions Study**

**Aparajita Jeedigunta
Primary Investigator
808-255-4779**

This research project is being conducted as a component of a dissertation for a master's degree. The purpose of the project is to learn how people in India assess various emotions. You are being asked to participate, because you live in India.

Participation in the project will consist of filling out a form on background information about yourself, and two other short forms about emotions. The forms about emotions will focus on getting your assessment of various situations. Data from the interview will be summarized into broad categories. No personal identifying information will be included with the research results. Completion of the form containing background data should take no more than 5 minutes. Each form will last no longer than 10 minutes. Approximately 500 people will participate in the study.

The investigator believes there is little or no risk to participating in this research project. However, there may be a small risk that you will experience psychological pain when closely examining your own emotions.

Participating in this research may be of no direct benefit to you. It is believed, however, the results from this project will help better understand the study of emotions and may lead to a better understanding of the Indian culture.

Research data will be confidential to the extent allowed by law. Agencies with research oversight, such as the UH Committee on Human Studies, have the authority to review research data. All research records will be stored in a locked file in the primary investigators office for the duration of the research project. All research records will be destroyed upon completion of the project.

Participation in this research project is completely voluntary. You are free to withdraw from participation at any time during the duration of the project with no penalty, or loss of benefit to which you would otherwise be entitled.

If you have any questions regarding this research project, please contact the researcher, Aparajita Jeedigunta at 808-255-4779

If you have any questions regarding your rights as a research participant, please contact the UH Committee on Human Studies at (808)956-5007.

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