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# A Validation of Emotional Contagion Scale on the Indian Youth

**Abstract**

The Emotional Contagion Scale (ECS) developed by Dr. Elaine Hatfield, is a self-report measure used to investigate the individual's susceptibility to catch another person's emotions and experience the same. The catching of emotions could be conscious or unconscious. The study aims to validate the Emotional Contagion scale on the Indian subcontinent population for future use and application. The original American scale consisted of 15 items to be responded to by selecting the suitable option from given five, was given to an Indian sample of 498 individuals. To check the validity, Confirmatory Factor Analysis (CFA) was performed. Gender differences were assessed and it was observed that men were high on catching and experiencing the emotions of others as compared to women. The Indian sample on ECS shows moderate to high reliability and high content validity. It thus concludes that the Emotional Contagion scale is valid for future use on the Indian Population.

**Keywords:** *emotional contagion, validation, reliability, gender difference*

## A Validation of Emotional Contagion Scale on the Indian Youth

An individual seems to be happy when people around him are happy or smiling; similarly, they feel sad or unhappy. One such aspect of relating ourselves to another

person's emotions is emotional contagion. Emotional Contagion occurs in three stages- Mimicry, Feedback, and Contagion. One's response and the context does play a vital role in the contagion that takes place. EC seems to be higher among those whose attention is directed on others rather than self, one who possesses interdependent self-construal rather than independence, those who are mindful of others' posture and gesture, and personalities who are emotionally responsive or reactive (Jeedigunta, 2008). EC also has proven evidence from a neurological perspective. It has been perceived that the neural system that gets activated during pain experience in the first person is the same in the other person observing the first person's physical or psychological pain (Englert, 2015).

Interpersonal factors and individual differences, affect the susceptibility to EC. Joyful individuals are more susceptible. It is also stronger in in-groups as compared to outgroups. Students seem more vulnerable to EC than to other professions like physicians, marines, etc. Employees with deep emotions from within, display a higher chance of letting the customer experience EC. In contrast, those who display surface-level emotions do not really let their customers experience EC (Englert, 2015).

By arguing that while in a crowd, individuals experience "collective hallucinations which are distortions of the external world encountered by people in crowds as a consequence of processes of "contagion" and "suggestibility," , Le Bon's study planted the roots for later social psychology research on conformity (Rogers, 1995).

Social media and EC have been showing that when in a group, they are high on the love subscale of EC, and when alone, they are high on the fear subscale. Powerful people are more sensitive in terms of expressing others' feelings, whereas powerless people are more aware of their emotions and are seen to be less likely to display or experience EC.

Intimacy among people predicts the level of EC that will take place. It has been seen to be higher among mother and child, a couple in love. Those who are further emotionally expressive; are more likely to be infected. When in a romantic relationship, an individual expresses a depressive mood, the related partner also shows less positive emotions and more negative views about the relationship. People in a romantic relationship try to connect better and show affection by regressing to child-like talking, increasing their bond and emotional expression. The presences of people we know increases the possibility of us undergoing the same emotions as the group. It also appears to be easier to imagine a pleasant experience with others vs alone. The presence of familiar people leads to positive emotional experiences, and the presence of unfamiliar people leads to negative ones. Fear as a subscale is

scored high when alone than in a group. For love, it is higher among groups than among individuals (Bhullar, 2011).

Looking at the current scenario of the COVID-19 pandemic and emotions that are being shared via the social media platform, it has been seen that, people share more negative emotions compared to positive ones. Fear and anxiety are shared in terms of negative emotions. Emotions are the valuation of how a person assesses and replies to the situation. Even a perceived threat is capable of motivating people towards experiencing negative emotions. Social media is often used to gauge the emotions that relate to crises. Evidence has been recorded; the terror attack of 2001 in NYC recorded high negative emotions being shared on social media, the missing flight MH307 induced anger, the 2012 Hurricane sandy expressed more anger and fear, etc. Early research in 2020 in the UK found anxiety, fear and sadness to be more prevailing among people regarding the coronavirus (Kleinberg, 2020).

When emotions are shared, it creates an emotion-sharing feedback loop where people tend to talk or write about an event in reaction to how others talk about it. This loop and EC are accelerated by digital technology and social media. Social media makes it easier to express and communicate emotions and thus increases the receivers of EC (Dubey, 2020; Hill, 2010).

In online communication, the receivers' emotions become more like the emotions of the people who posted the emotional message. This, phenomenon is absent in offline EC (Goldenberg, 2020). When emotional contagion occurs through social media, it contributes to a long-lasting change in how people emotionally relate to the world. Emotions are built on the individual's concerns. They focus our consideration on a particular thing or aspect of a situation that is relevant to our concerns.

When positive emotions are shared, it widens cognition, and people tend to notice broader possibility and creative ideas. On the other hand, when negative emotions are shared, it narrows the mindset, and puts attention on the perceived threat and means of avoidance and survival (Steinert, 2020). The sharing of emotions could be positive and negative. Surprisingly, for the contagion to occur, face-to-face communication is not the only possibility; social, media plays an equally important role (Herrando, 2021). When engaging online, consumers link high ratings and favourable reviews to happy feelings, whereas low ratings and unfavourable reviews are linked to negative feelings (Xu, et al. 2020).

In the psychological context, contagion describes the transmission of various phenomena within human behaviour. In order to study the transmission of emotions from one individual to another, the self-report measure developed by Elaine Hatfield is being carried forward to establish the scale's reliability among the Indian population.

The study's objective was to validate the Emotional Contagion scale developed by Elaine Hatfield on the Indian population. Validation studies help the researcher identify the error that could exist when we try to study the opinion and behaviours of the specific population so that we can further try to minimise or eliminate the same. Expressing and experiencing emotions differ from culture to culture. Hence before using the scale on the Indian population for research, it is essential to validate it. The statements in the original scale were developed for different cultural and geographical backgrounds. In order to see whether the same items connote the same for the population of India, a validation study was vital to establish the reliability of the responses.

## Method

### Participants and Procedure:

The study consisted of 498 sample from India. The sample included 193 (38.76%) males and 305 (61.24%) females with an average mean age of 26.49 (SD= 8.54) and 26.35 (SD= 9.37) respectively. The participants had various social and educational backgrounds, which enabled the results to be generalized. The inclusion criteria for the participants were minimum high school completion, knowledge of the English language, and belonging to lower-middle to upper-middle socio-economic status. Participants were required to be more than 18 years of age and have Indian nationality. All the participants underwent ECS, and the psychometric properties relating to reliability and validity were found. Participants were all reached through email and social networks. The procedures and objectives of the study were provided, and written consent was attained before voluntary participation in the study.

The Emotional Contagion Scale, originally developed by Dr. Elaine Hatfield, was available in English, which did not require any translation and was used to assess the Indian population; without disrupting the face validity of the scale. Author permission was received before using the same.

Cronbach alpha was performed for reliability and CFA was checked for the scale. the scale's reliability and validity were observed to be moderately high for the Indian trial.

## Measure

**Emotional Contagion scale:** The Emotional Contagion Scale is a 15-item self-report measure used to assess individual variances in inclination for emotional contagion. The items are grouped conferring to the five basic groups of emotions: Love (e.g., Item 9 "I melt when the one I love holds me close"), Happiness (e.g., Item 11 "Being around happy people fills my mind with happy thoughts"), Sadness (e.g., Item 1 "If someone I'm talking with begins to cry, I get teary-eyed"), Anger (e.g., Item 7 "It irritates me being around angry people"), and Fear (e.g., Item 8 "Watching the fearful faces of victims on the news makes me try to imagine how they might be feeling") (Doherty, 1997). Three characteristics distinguish each sort of emotion, rated on a 5-point Likert scale and coded as 1: Never true of me, 2: Rarely true of me, 3: Usually true of me, 4: Often true of me, and 5: Always true of me. The factor loads for the original scale range between 0.46 and 0.69. The full-scale Cronbach alpha was 0.90. For the subscales, the positive ones were 0.82 (love and happiness) and for the negative it was found to be 0.80 (fear, anger and sadness).

## Statistical Analysis

The Statistical Package for Social Sciences (SPSS) licenced version analysed the data for descriptive statistics, reliability, and validity, a homogeneity test. Cronbach alpha was performed to test reliability and, content validity was done for validity check. For comparability of the mean difference among gender, t-test was used. CFA was carried out using the licensed version of IBM AMOS.

## Results and Discussion

The study's main objective was to validate the scale on an Indian population. The test provided reliable psychometric values with moderately high reliability and validity. Internal consistency reliability was determined to be 0.72. Doherty (1997) in her original study found similar solutions. (Rueff-lopes &; Caetano, 2012). Similar to previous validation studies of the scale (e.g., Lundqvist, 2006; Kevrekidis, et al. 2008), the outcomes of the present study confirmed that woman have a higher susceptibility to emotional contagion as compared to men. To talk about emotional experiences, it has been extensively supported that females have

a stronger inclination to show responsiveness to emotional facets than males, are more emotionally expressive (Kring & Gordon, 1998; Huang & Hu, 2009), and answer more strongly to emotional stimuli.

The outcomes of the present-day study also replicate the Swedish study, where the internal consistency reliability was found to be α= 0.76 and also similar to the Greek study, where it was α= 0.74. The American form of the ECS is unimodular, and the Greek and Swedish versions are multidimensional as an outcome of the factor analysis, as discussed being valid in the American study (Doherty, 1997). The KMO measure of sampling adequacy obtained was .818 indicating no reduction required and is further suitable for factor analysis. Bartlett's test of Sphericity indicated ($x^2$ (df=105) = 1666.110, p< .000).

The 15-item scale of Emotional Contagion was analysed for CFA. Correlation coefficient values were found at various acceptable levels as mentioned in Table 1. The subscale reliability for Happiness was found at α=.69, Love α=.72, Fear α=.63, Anger α=.65 and Sadness α=.64. CFA results show a high value for subscales on Love which is at an acceptable level. The other 4 subscales resulted in moderate confirmation of the items on the Indian population. Any factor loading value above .50 will be accepted and further used in the study. Compared to the original

**Table 1.** Factor loading

| Subscales | Item no. | Current study | Original study |
|---|---|---|---|
| Love | 6 | 0.72 | 0.67 |
| | 9 | 0.73 | 0.53 |
| | 12 | 0.79 | 0.46 |
| Happiness | 2 | 0.59 | 0.49 |
| | 3 | 0.47 | 0.56 |
| | 11 | 0.74 | 0.68 |
| Fear | 8 | 0.50 | 0.59 |
| | 13 | 0.62 | 0.69 |
| | 15 | 0.56 | 0.49 |
| Anger | 5 | 0.44 | 0.48 |
| | 7 | 0.39 | 0.53 |
| | 10 | 0.57 | 0.62 |
| Sadness | 1 | 0.58 | 0.62 |
| | 4 | 0.62 | 0.53 |
| | 14 | 0.59 | 0.53 |

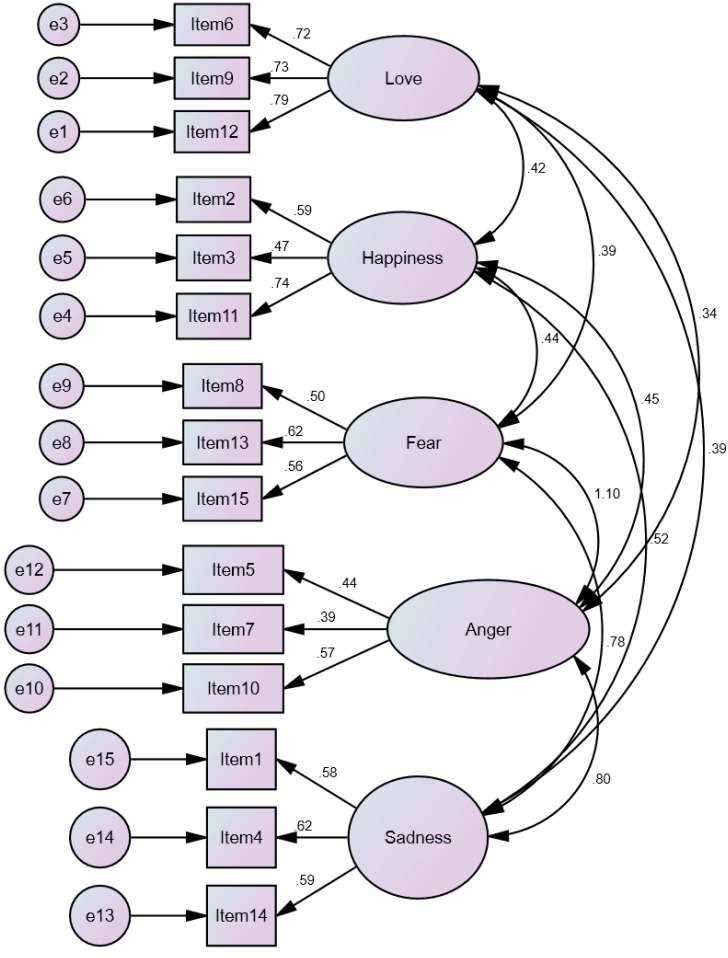


**Fig. 1.** Confirmatory Factor Analysis

study's factor loadings, the following were the results. The original scale on EC accepts all the values for the final scale. The lowest value found was 0.46. Hence, in the current study, which validates the scale on the Indian population, any value above 0.46 will be accepted and used on the population.

Table 1 indicates individual item factor loading of the original scale developed by Dr. Hatfield and simultaneous to which, the factor loading of the present study is tabled for comparison.

## Gender difference

Differences between genders were tested using t-test. Levene's test for Equality of Variance obtained is .403 (p> 0.05) (F= .701), where we fail to reject the null hypothesis and thus say that there is equal variance among the two sub-groups of gender. The average mean difference between the two genders shows that females score higher than men. The mean age for males was 26.49 (S.D.= 8.54), and for females was 26.35 (S.D.= 9.36). T-test reveals the difference among gender to be t=2.015. The mean differences for men and women were 53.54 and 51.83, respectively. For subscales, women score higher than men on love, whereas men score high on happiness fear, anger, and sadness. Previous research shows that females score higher on happiness, love and sadness but not anger (Lundqvist, 2006).

**Table 2.** ECS Mean scores and internal consistency

| | | Total (n=498) | | Males (n=193) | | Females (n=305) | | |
|---|---|---|---|---|---|---|---|---|
| Scale | No. of item | M | SD | M | SD | M | SD | Cronbach α |
| Full ECs | 15 | 52.49 | 9.26 | 53.54 | 8.94 | 51.83 | 9.40 | 0.72 |
| Happiness | 3 | 12.08 | 2.19 | 12.09 | 2.21 | 12.07 | 2.17 | 0.64 |
| Love | 3 | 11.72 | 2.87 | 11.50 | 3.04 | 11.86 | 2.75 | 0.76 |
| Fear | 3 | 9.72 | 2.64 | 9.90 | 2.67 | 9.60 | 2.62 | 0.57 |
| Anger | 3 | 9.56 | 2.39 | 9.66 | 2.45 | 9.49 | 2.35 | 0.46 |
| Sadness | 3 | 10.15 | 2.72 | 10.37 | 2.66 | 10.01 | 2.75 | 0.64 |

Note: α values significant at 0.001 level.

The findings reveal that the EC scale, as validated in numerous countries and found to have high psychometric properties, can be used on the Indian Youth, with the scale's reliability and validity being reasonably high. The aim was to validate that the measure and the scale's psychometric properties is acceptable with internal consistency at 0.72 and moderately high validity. Regarding emotional experience, it is widely supported that females have a stronger tendency to show responsiveness to emotional aspects like love than males, whereas males are further emotionally communicative on aspects like happiness, anger, fear and sadness.

Among the five subscales, the items on anger as a subscale showed low reliability when assessed on the Indian population. In order to include the items of the anger scale, certain factors could play a role, out of which culture is the most prominent one.

Considering the cultural background, traditional Indian society suppresses the female gender to show anger or sadness. It has always been dominated to not show the true emotion; hence the factor loading on subscale anger was considerably low compared to other subscales. The same was also noticed in the original scale by Doherty. If we consider the cultural aspect, we can still retain the items on the anger subscale as it is a result of the Indian culture.

The Emotional Contagion Scale has one major advantage over other empathy scales: it offers information on various emotions that the empathy scale does not. For example, the Mehrabian and Epstein scale measures reusability and vicarious replying. Both scales give evidence of emotional arousal. Nevertheless, the ECS is the unity that suggests the correspondence between the emotional stimulus and the emotional response. The individual's observed and experienced emotions are in direct communication and are referred to as primitive emotional contagion.

The social environment recognises the importance and value of emotional contagion. To discuss its significance in organisational settings, the ECS impact group dynamics through its impact on different emotions and the group's emotional merging toward certain emotions. The outcome of anger that employees absorb during social exchanges at work is likely to persists after coming home and characterises an emotional demand that weakens the physiological functions regulating restorative sleep and energy recharging This impact appears even stronger among employees who observe higher levels of structural production pressure (Petitta, et al, 2021)

## Study Limitations

The study's participants were from a non-clinical background, and the clinical population result would differ. Further studies may incorporate the clinical set-up and differentiate it from the non-clinical population. The smaller number of items per subscale could have affected the factor structure whereas few facilitated the process. Age comparisons could also be a future scope with the scale.

## Conclusion

In conclusion, the Emotional Contagion Scale is a valid and a reliable measure that can be assessed on the Indian population. The theory of arousal serves as the foundation for emotional arousal, explaining how a combination of two ele-

ments—the amount of pleasure (positive/negative) and the intensity of arousal (relaxed/activated)—triggers emotions. Emotional arousal is infectious during human encounters, and this paper examines and categorises the methodological techniques and theories that explain this phenomenon (Russell, 2003).

The analysis of the literature reveals that in order to comprehend the behavioural synchronisation brought on by emotional contagion, academic research on the topic has mostly concentrated on human contact. Future lines of study should also explore the problem of emotional contagion in human-robot interactions in light of the incorporation of artificial intelligence (AI) technologies, such as chatbot or voice assistants, as a method of enabling or supporting business interactions and transactions (Matsui, 2019). The original scale items developed by Elaine Hatfield yield similar results with the Indian population. Future researchers may rely on the version to amount emotional contagion in Indian sample. All the scale items can be used for further research on the Indian population.

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