

## The Digital Pulse: Exploring Emotional Contagion in Online Networks

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**Abstract:** This research explores the phenomenon of emotional contagion in online settings, the way emotions are transferred through the interactions that take place online. Previously seen occurring in face-to-face situations—when emotions are spread via facial expressions, tone of voice, and body posture—emotional contagion today has taken on new forms. Social media sites, videos, and online forums now serve as new mediums by which emotions can spread quickly. Based on Affective Process Theory, this study investigates the processes by which emotional contagion can occur in online environments, such as shared views, imitation, and empathic involvement. The research explores the impact of digital stimuli and investigates both convergent and divergent emotional connections, along with dominant factors influencing emotional transmission, including user familiarity, platform architecture, and social context. In addition, it measures the implications of emotional contagion on individual behavior, group dynamics, and general societal discourse. Empirical evidence from several social media platforms and digital communication platforms illustrates the extreme impact of emotional contagion on online engagement. By providing an overall understanding of emotional contagion in the digital world, the research sheds light on the organizational, social, and psychological effects of digital emotional contagion. The research has direct implications for media strategies, content moderation, and encouraging digital well-being.

**Keywords-** Digital contagion, Emotional contagion, online network, appraisal theory.

### INTRODUCTION

Humans being innately social, create social bonds among peer groups, organisations and other social or professional settings where they interact, and here it is seen that they tend to imitate each other (Numan, 2016). This action of catching another's emotions through facial expressions, speech, body postures and movements is known as emotional contagion (Hatfield et al., 1993; Van Kleef et al., 2010). This may happen unconsciously resulting in mimicking speech, behaviour and emotions. Thus, when directly encountering other individuals, one eventually exhibits the same emotions and behaviour, implying that the "catching" of emotions and mood through emotional contagion (Hatfield et al., 1994). Facial expressions may explain why one's emotions are displayed by another. However, additional research suggests that emotional contagion occurring in offline spaces only partially explains this link (Olszanowski et al., 2020; Chen, et al., 2024). There's the possibility of this catching and demonstrating of emotions due to new mediums like those occurring in digital spaces.

With the advent of digital technology, humans interact with others differently. Humans now use electronic devices for the purpose of storing and processing data as well as virtually communicating over social media platforms (Pandya & Lodha, 2021). According to the Internet in India 2023 report by the Internet and Mobile Association of India and KANTAR, over 800 million Indians use the internet with more internet users seen in rural areas. 90% of the internet users use internet on a daily basis, spending 1.5

hours on average. Hence, these internet users have access to a plethora of activities including net commerce, digital payment, online learning and online gaming. 70% use internet for social media, 76% for communication and 86% for OTT (Audio + Video). The figure of users watching only video content (208 million) over internet i.e., the cord cutters are over and above the users watching content only on linear television (181 million). Of the 86% utilizing OTT, 80% OTT users have in the past year used music streaming apps and video OTT users have witnessed 8% growth in the user size of Online Music Streaming Services. 36% of the OTT users fall in the 25 -34 years age group. Of the 821 million internet users, 65% source their news and information online via several news apps/websites, social media posts, message forwards and YouTube amongst others. This information is received either consciously or subconsciously. Only 25%, i.e. 205 million users consciously avail of this which can be classified according to age groups. Of the conscious online news users, 43% fall below the age of 24, 39% was between 25-44 and 18% above 44 years. How we act and think is affected by emotionally charged content where the information online gets disseminated in social media networks. When this emotionally charged content is broadcasted on social media, our conceptions of concerns in relation to morality, ideology (Brady et al. 2017), politics, terrorism (Vosoughi et al. 2018), and financial investments (Bollen et al. 2011; Weisz, & Cikara, 2021).

EMOTIONAL CONTAGION -  
UNRAVELLING THE ROOTS

The sharing of emotions, or emotional contagion, is a universal phenomenon of widespread significance in the psychological and organizational behavior literatures. It has been best defined as “a process in which a person or group influences the emotions or behavior of another person or group through the conscious or unconscious induction of emotion states and behavioral attitudes” (Schoenewolf, 1990; Van Kleef, & Côté, 2022). The concept of “Affective Process Theory was introduced by Elfenbein, 2014, to address the gap in research of Emotional contagion. It answers the question on how to develop a systematic theory in order to unite the roles of social comparison, emotional interpretation and empathy, as researched in other scholarly articles, and potentially identify others. The authors will be taking this theory as the basis to determine emotional contagion in the digital sphere. In the digital sphere, the medium of communication has shifted from a physical or offline to an online space. Where interactions are generally anonymous, it could be assumed that the emotional contagion may not be present since the individuals are not directly affected by emotions but only through a digital interface. However, it is without denial that the most of the human population spends a lot of time in the digital space and with future innovation, such augmented reality (AR), Virtual Reality (VR) or the “Metaverse” blurring the line between reality and the digital world. Only the medium of interaction with other humans change.

The scale of interaction has an increased range permeating boundaries and through our electronic devices. The scale of interaction creates many touchpoints for the user, which results in familiarity with the virtual structure of the internet namely websites, comment sections, video sharing applications, news applications, social media, online discussion forums, game chats and many more. Many of our physical interaction have shifted online, with our relatives, family, friends being able to interact online through social media and being kept updated with the day-to-day activity of our lives. It also opens doors to interacting with people we do not generally have an interaction. These ‘users’ belong to different backgrounds and personalities; they interact with other users using the same interface (Weisz, & Cikara, 2021; Chen, et al, 2024). With ample of time spent on the internet, these anonymous users become familiar personalities with their own unique styles of interacting, via texts, via call, or video. We should be able to observe primitive mimicry as Hatfield had coined, in texting patterns, virtual speech patterns and other behavioral cues.

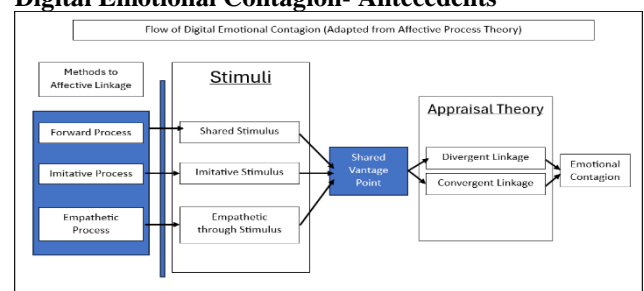
The affective process records multiple touch points between two users’ affective processes. These touchpoints are when we can observe the social influence on emotion. The distinct mechanisms of the affective process theory form a connection between the affective states of two users referred as an affective linkage. An affective linkage can be convergent, divergent or complementary. We would be exploring that in a later section, but first let us understand the emotion process. The emotion process consists of the following steps (a) Stimulus (b) Emotional Registration – the interpretation of stimulus on self (c) Emotional

Experience – the subjective feelings that we generally call emotions (d) Emotionally expressive cues – non-verbal and verbal expressions (e) Post Emotional responses – attitudes, behaviors and cognition influenced by emotional experience.

The affective process theory is modelled around the three visible processes – stimulus, emotionally expressive cues, and post emotional responses. The focus of this study is to conceptualize the effects of stimulus that would lead to Digital Emotional Contagion. For us to reach that state, we will be understanding all the related theory.

Affective Process Theory takes appraisal theory of emotions as a starting point. (Frijda, 1986; Lazarus, 1991; Scherer, 1988a). The theory discusses that the emotional registration process leads to a subjective interpretation of events, and not objective analysis. Even with the presence of objective attributes. Basic emotions theorists argue that humans instantly and automatically encode events using a cognitive appraisal process that is an ordered sequence of checklist (Ekman, 1992; Frijda, 1986, 2007; Lazarus, 1991; Scherer, 1988a, 1995). A primary appraisal determining the positive or negative implications of the event is interpreted (Lazarus, 1991) with an additional step of checking for novelty of the event. Subsequently an attentional activity that is, whether an event should be approached, avoided, or ignored. An anticipated effort, to remain passive or involve one’s self is assessed. Other factors such as the initial causal agent, who has current control of the event, certainty, perceived goal obstruction, consistency of the norms and fairness comes into play. (Frijda, 2007; Smith & Ellsworth, 1985). This primary appraisal is a split-second assessment when appraising any situation. An example in a college scenario, where a group was required to submit a project by the deadline however, they missed the deadline and professor would not allow an extension. A primary assessment would lead to finding the cause of delay. The emotions will range from Anger (someone else), guilt (oneself) and sadness (no one). A similar situation can be taken in the digital space, an outcome of an online betting match, a win would equate to a happiness for winning (on oneself), anger for losing (someone else), sadness or guilt (on oneself) and more studies can be done on the emotional effects of gambling too. This appraisal is only the initial judgement which is passed and observed as emotion. The appraisal of such situations is generally subjective adhering to a few observations such as hedonic bias in the above case.

#### Digital Emotional Contagion- Antecedents



**Fig.1.1 – Conceptual framework (author created)**

The conceptual framework highlights the various antecedents that can lead to emotional contagion in the online space. The authors postulate the occurrence of the affective linkages which affect the stimuli which when interact with a shared vantage point can lead to the appraisal theory components. The resultant behavioural dynamics is the incident of emotional contagion. The appraisal theory is an important tool to develop a model on affective linkages. It sheds light on diversity of emotional states across individuals. The theory propounds three main affective linkages – convergent, divergent, and complementary. Which can be observed by assessing the Shared Vantage Point (henceforth SVP) of the individuals. It evaluates if the source and recipient of emotional linkages are experiencing the same event from the same perspective. In case of a high SVP, the resulting affective linkage is either convergent or divergent. A convergent linkage is formed when the shared stimulus is interpreted in the same way. A divergent linkage is observed when the recipient responds to the shared stimulus with a different interpretation. In the case of a low SVP, this occurs only when the source itself is object of appraisal for the recipient which lead to a complementary linkage. This complementary linkage is affected by a vast range of moderating factors for contagion. However, this study will not focus on the complementary linkage for its conceptual model at this point. SVP is the central structure which explains when the three types of affective linkages are experienced. It integrates the vast moderating factors for contagion including structural and motivational factors like social closeness, in group v. outgroup membership, cooperative or competitive situation and power. These are some of the factors that lead to a high v. low SVP. SVP allows us to dive into a deeper understanding of the vantage points taken in an online stimulus. The authors believe that the determination of an SVP would not be different from what can be assessed in an offline scenario with the presence of a shared stimulus which would be discussed in a further section. However, for clarity's sake all online users who are using the same online platform for a specified purpose would share the same demographic, psychographic, or motivational factor set up to attract that audience to that platform. To simplify, similar personalities using the same platform hence forming a loose online community. Shared Vantage Points are increased when the recipient is exposed to the same structural factors in an offline setting are when, Job Roles expose the employees to the same or different work environment, the level of social interaction, Cooperation v. Competition, Low v. High Power, familiarity with each other.

In the digital space, there is a shared structure that users interact with that is the websites, comment section, discussion forums, video sharing application etc. However, we would have study further whether these structures play a pivotal impact towards shared vantage point and subsequently emotional contagion. Though in the case of motivational factors such a liking, empathy, personal stimuli, online chat groups, content subscription, and familiarity or unfamiliarity of other users who may be family, friends, known personalities, frequently interacted with users or unknown anonymous users. When moving through the emotion process under Affective Process

Theory by Elfienbien (2014). There are mainly three methods of moving through the emotions – (a) forward process (b) imitative process (c) empathetic process

The affective process theory formulates ten distinct mechanisms. In the figure, the mechanisms are cross examined by the three methods of forward, imitative, and empathetic and the three externally available processes of initial stimulus, expressive cues, and post-emotional responses.

The three methods of forward, imitative, and empathetic move laterally through the externally available processes of initial stimulus, expressive cues, and post-emotional responses.

## **EACH OF THE METHODS IS EXPLAINED AS FOLLOWS.**

A forward process is the standard walkthrough within the emotional process which moves from left to right. In the forward process, an initial stimulus or post emotional behavior flows into emotional registration and expressive cues flow into emotional recognition.

An imitative process is observed when a socially visible factor is imitated before feeding into the emotion process. In this case the imitation of stimuli or behaviour may occur without direct interpersonal contact or without awareness of the other party's existence. However direct access to the other party is important to be able to imitate emotionally expressed cue – subtle verbal or nonverbal expressions, this is called primitive mimicry as propounded by Hatfield et al. (1994).

Empathy is defined as “an emotional response that stems from another's emotional state or condition, is congruent with the other's emotional state or condition, and involves at least a minimal degree of differentiation between the self and other” (Eisenberg & Fabes, 1990, p. 132). In the empathetic process, contagion in evoked by the recipient who emotionally registers the stimuli from the perspective of the source instead of their own.

There are four factors to empathy – perspective taking, fantasy, empathetic concern, and personal distress (Davis, 1983; Eisenberg & Fabes, 1990). Perspective taking is considered a primary factor for affective linkage. Accordingly, Hatfield et al. (1994) describe how the cognitive processes whereby individuals imagine another person's emotional state can lead them to share that state. Along these lines, experimentally inducing perspective taking leads observers to converge with the target's emotional state (Hodges & Wegner, 1997; Neumann & Strack, 2000)

Generally speaking, scholars have argued that empathetic linkage should lead to congruence (Eisenberg & Fabes, 1990; Hatfield et al., 1993), but there are two reasons why that may not hold true. The first reason being that there can be an error in perspective taking. People can misread a situation. For example ‘empathizing’ with a self-conscious person who actually feels amused, a righteously angry

person who truly feels despondent, or an overwhelmed person who is actually relishing a novel challenge. That is, an empathetic partner can only share an emotion when they correctly infer the emotion that the other party would actually feel.

The movement within the emotional process through the three methods as mentioned above, can be super imposed in the digital space. With the advent of online forums, video sharing applications, it has become far easier to interact with personalities without meeting them in person. The digital interface allows us to create a virtual bond that evokes a degree of emotions within the recipient.

The authors would discuss the methods in more detail in the context of the type of stimuli that is exposed to the recipient, that is, Shared Stimulus, imitated, Stimulus, and Empathetic through Stimulus. In the digital context, this stimulus is originated through the digital interface. Here, the source – the digital interface, can be traced from an anonymous user or a known personality. The authors postulate that over time the “anonymous” user can become a familiar personality which will eventually lead to emotional contagion. Individuals can link the shared vantage point with the stimulus being delivered through a digital interface by the source to the recipient. The source maybe a known personality or an anonymous user with frequent or infrequent interactions in the same chat forum like Discord, Discus or Reddit. In a digital scenario with avid exposure to the various sources of media including news, social media posts, trends, and online chat forums. We discover various stimuli that affect the recipient. The source of stimuli is generally anonymous and is generally not physically present. The Stimuli occurs through a digital interface which affects the emotions of the recipient.

### **ALL THREE TYPES OF STIMULI CREATE A HIGH VANTAGE POINT**

**Shared Stimulus** – In the shared stimulus, the emotional linkage occurs when two individuals share the same initial stimulus. For example: In a structured environment where individuals are exposed to the same set of norms suppose, college students being exposed to the same set of rules and regulations, physical space, staff and professors. The SVP is high here since this mechanism links the individuals who may not have a direct connection or even know of the other party's existence. It may be inferred that the source is directly responsible for spreading the emotion but rather it is the individuals who have come to an emotion on their own. This shared stimulus can be interpreted differently or similarly thereby creating an affective linkage – divergent or convergent respectively. The same can be applied in a digital sense, where the two individuals who have been exposed to the same video sharing application, and interacted with the same video content may form an emotional contagion through this shared stimulus based on the content they had consumed. The content consumed, that is, the source provides stimulus and starts the emotional process. This process can be further explored to understand the mechanism deeply and how the media with respect to Emotional Appraisal theory in the Digital Sphere.

**Imitated Stimulus** – In the imitated stimulus, people replicate the stimuli of those around them, which is registered as a shared stimulus. However, a distinction can be made since the common stimulus did not occur independently to each individual rather that the individuals had to imitate it. This sort of reaction to the stimulus can be taken in a school setting where a dress code is enforced. Norms influence us to imitate workplace stimuli, and affective events theory argues that a wide range of workplace stimuli are emotionally evocative (Weiss & Cropanzano, 1996)

**Empathetic through stimulus** – the empathetic process can start with any step of the visible emotion process – stimulus, expressive cues, or post emotional behavior. In the empathetic through stimulus mechanism, the recipient has to become aware of the emotionally evocative event then put themselves in the other person's shoes. (Hawk, Fischer, & Van Kleef, 2011). This act of visualizing another person's feelings then rubs off on the imaginer. Empathetic processing typically results in high SVP—which leads to convergent or divergent linkage. As discussed above, the two exceptions are when individuals' emotions diverge due to inaccuracy when attributing the other party's emotions or when they are complementary due to the recipient's consumption value of the source's emotion, with the latter involving low SVP. For example, if a known personality on the internet evokes a sense of happiness or sadness, the recipient consuming that content will be able to respond to that stimulus as assess those emotions empathetically. In such cases, the viewer may relate to the speaker and form emotional contagion.

**Convergence-** In an offline setting, the emotional convergence of individuals in close relationships is assessed via a sociopsychological lens. Anderson, Keltner, and John (2003), in their research, through cross-sectional longitudinal research designs examined three studies detailing the emotional convergence of dating partners and same-sex college roommates. At two different points of time, the emotional response of a dyad to stimuli was recorded while performing longitudinal studies. The response could be in the form of anger, contempt, discomfort, disgust, fear, guilt or sadness with the results bringing to light the dyad's growing similarity leading to a convergence in their emotional experience. To add to the findings, convergence is an adaptive and asymmetrical process which takes place even in the situation where it is not possible for displays of emotion to be detected by the members of a dyad. Inherently the dyad carries out a significant role in encouraging emotional convergence which also impacts the process by subjecting the members of the dyad to face events similarly and/ or make the acclimatization required for the convergence to take place. Thus, this shared experience can be attributed to personality similarity and dyadic attachment style. An individual's personality can impact their emotional response to stimuli as well as their prowess to govern one's own emotions (Tobin et al. 2000). When compared to less conscientious people, those who are conscientious, on being exposed to negative feedback witness less anger and are unlikely to act aggressively to such feelings of anger (Jensen-Campbell et

al. 2007). On the same lines, it has been established that agreeable individuals in comparison to those who are less agreeable are less likely to partake in aggressive behaviour on being exposed to stimuli like violent media that incites aggression (Meier, Robinson, and Wilkowski 2006). It has been observed that neurotic people are more likely to experience negative emotions, whilst extroverts are more likely to experience pleasant emotions (Watson and Clark 1992). According to Jensen-Campbell et al. (2007), personality has been shown to influence people's emotional reactions to events because it causes people to behave in preset ways when faced with emotionally charged stimuli.

Divergence-According to van der Schalk et al. (2011), there may be more emotional divergence than convergence in encounters between members of different groups. Divergent linkage occurs with a shared vantage point but unlike convergence, there exists differing interpretations (Barsade, S. G., Coutifaris, C. G., & Pillemer, J. 2018). Divergent emotions in response to team events may arise from members with limited involvement in the team and multiple team identities, whereas strong team identity may promote emotional contagion among the members (Rhee, S. Y., Park, H., & Bae, J. 2020). Although people can mimic one other's emotional expressions when interacting online, the uncertainty of the content and the lack of non-verbal clues may make it more challenging than when interacting face-to-face. Given that negative expressions go against social standards, they become more apparent and contagious than positive ones, which makes them easier to disseminate electronically. We may improve our comprehension of the affective dynamics of work teams by looking at how the virtual context, a relatively new work environment, affects the emotional contagion process. In their study of host-tourist interactions, Zhang, S., Chen, N., Hsu,

C. H., & Hao, J. X. (2023) found that unfavorable interactions, for example, MCTs carrying a luggage on the street can impede the pedestrian way. Respondents in Hong Kong held unfavorable prejudices about MCTs, displaying negative emotions even when tourists in films expressed pleasant emotions. A Parkinson (2020) study found that emotional differences between hosts and tourists can be attributed to cognitive appraisal of social circumstances. Improving host-tourist interactions requires addressing interaction context and stereotypical behavior.

The divergence of negative affect could signify a general desire among group members to avoid becoming engaged with each other's negative feelings, hence steering clear of interpersonal conflict (Foo, S. C. 2009). Anger divergence in the group, in which group members are not as inclined to display the same angry emotions as their peers, provides preliminary evidence for the tendency for anger, a discrete negative emotion, to elicit complementary responses rather than mimicry. The expression, experience, and spread of anger in workgroups may be damaging to harmonious task-focused relationships, driving group members to avoid "catching" this bad emotion. The divergence of negative affect may be attributed to group anger, rather than group anxiety (which has no significant impact on team members'

anxiety levels). This supports the need to investigate discrete negative emotions as they may have unique nomological networks with affect-related variables as opposed to the broad construct of negative affect (Barsade et al., 2018).

### **Measuring emotional contagion- Studies in the online sphere**

Scholars have used numerous methods to assess emotional contagion. An observational Twitter study conducted by Ferrara and Yang (2015) established a significant connection in relation to the user's emotional expressions and the feed witnessed by them. It is seen that positive posts appear after 4.50 percent more positive content while negative tweets appear after 4.34 percent more negative posts than baseline. Mayshak et al. (2016) took on an experiment wherein three neutral and one negative emotion posts were shown to 80 people who had achieved baseline mood and cognitive assessments. Thereafter, each post was replied to in free text by these participants. Then the mood and cognitive assessments was repeated for them. It was observed then that these participants' attitudes were lower. It was after being exposed to an emotionally damaging post that an improvement in organisational performance was noticed. This was attributed to their belief that they were stimulated by defined emotions surrounding them leading to a better cognitive performance. This demonstrates the existence of emotional contagion on social media sites with the possibility of there being unfavourable implications. Findings by Rosenbusch, H., Evans, A. M., & Zeelenberg, M. (2019) expands on research done previously to show that while the occurrence of contagion and homophily effects are seen on Twitter (now X) or Facebook i.e., message-based social media applications, the same is also visible on YouTube which is a video- based platform. Rosenbusch, H., Evans, A. M., & Zeelenberg, M. (2019) surmise that YouTube is very influential with respect to the origin of one's emotions and the focal point for emotion communities. This is due to the evocative emotion expressions in video format as well as the fact that vloggers have a huge subscription base where their millions of followers watch their frequent vlogs. Rosenbusch, H., Evans, A. M., & Zeelenberg, M. (2019) deliberate that in addition to contagion and homophily effects, a variety of other devices, including empathy, compassion, and audience socialization, are presumably responsible for the dissemination of emotions throughout social networks. These mechanisms contribute to understanding why connected users exhibit identical emotions.

### **CONCLUSION**

While emotional contagion is a consequence of being in contact with or observing another's emotions, this can also be seen in the digital space. Key moderators of the emotional contagion phenomenon include individual differences in people's attention, perceptions of interdependence, and dispositional susceptibility to emotional contagion. In the digital sphere, known personalities have an influence over their audience, who connected to them on a consumer, emotional or human level. By going through the emotional process and the affective process theory the receiver may form emotional



contagion with the internet personality. A natural topic to explore is whether negative emotional contagion spreads more rapidly or powerfully than positive emotional contagion. Researchers have found that individuals generally react differently to positive and negative emotional stimuli. Negative events are thought to cause quicker and more potent emotional, behavioral, and cognitive responses. Though not the primary focus of this study, it is noteworthy to study the effect of such biases in our emotional process and how it may cause contagion when clubbed with other factors like influence, power and charisma. In conclusion, the past two decades has allowed for the dynamic and fascinating exploration of the occurrence of emotional contagion. Research has shown this affective conduit through which people and groups communicate and influence others by sharing emotions, often insentiently. Further research can develop a deeper and more nuanced comprehension of emotional contagion and how it influences significant consequences at the individual, group, organizational, and societal levels.

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