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Emotional Contagion as a Precursor to Collective Emotions

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Abstract

Early writers, journalists, and sociologists such as Gustav Le Bon (1896) and Charles Mackay (1841) sparked an interest in the “group mind” and the “madness of crowds.” They explored the process of hysterical contagion in a variety of societies and natural settings. In this chapter, we will review the theory of primitive emotional contagion and discuss contagion as a precursor for collective emotions. In recent years, historians, medical researchers, and epidemiologists have begun to apply and extend Emotional Contagion Theory to collective emotions and the social contagion of various mental and physical diseases. We will end this chapter by reporting on the new and compelling research documenting that under a variety of conditions, individuals may catch their fellows’ moods and emotions—such as joy and happiness, depression, and loneliness; and may also display increased susceptibility to physical problems that could be sparked by intense emotion—such as allergies, obesity, reactions to chemical spills and environmental hazards, and the like.

Keywords: Emotional contagion, hysterical contagion, madness of crowds

Epigram: Ideas, sentiments, emotions, and beliefs possess in crowds a contagious power as intense as that of microbes. Gustave LeBon (1896, p. 127).

Emotional Contagion as a Precursor to Collective Emotions

Scholars from a variety of disciplines—neuroscience, biology, social psychology, sociology, and life-span psychology—have proposed that *primitive emotional contagion* is of critical importance in understanding human cognition, emotion, and behavior. Primitive emotional contagion is a basic building block of human interaction, assisting in “mind-reading” and allowing people to understand and share the feelings of others by “feeling themselves into” the other’s emotions (Ramachandran, 2011). In this paper we will discuss the theory of emotional contagion, which we believe provides a theoretical foundation underlying many of the consequences (both good and bad) caused by contagion. We will discuss what historians have discovered about collective emotions, such as dancing manias and mass hysteria; what cultural psychologists and anthropologists have learned about arctic hysteria and mimicry contagion; what sociologists have learned about “mysterious” epidemics; and modern-day epidemiologists have learned about the spread of emotions—such as happiness, anxiety, depression, and loneliness. They have concluded that these emotions are as contagious as the most virulent of infectious diseases.

Theoretical Overview

Emotional contagion is best conceptualized as an interrelated grouping of social, psychophysiological, and behavioral phenomena. Theorists disagree as to what constitutes an emotion. Most, however, would agree that emotional “packages” comprise many components, including: conscious awareness; facial, vocal, and postural expression; neurophysiological and autonomic nervous system activity; and instrumental behaviors. Different portions of the brain may process the various aspects of emotion. However, because the brain integrates the emotional information it receives, each of the emotional components acts on and is acted upon by the others (see Hatfield, Cacioppo, & Rapson, 1994, for a discussion of this point).

How have theorists defined emotional contagion? Hatfield, Rapson, and Le (2009, pp. 19-20) define primitive emotional contagion as: “The tendency to automatically mimic and synchronize facial expressions, vocalizations, postures, and movements with those of another person and, consequently, to converge emotionally”. Scholars have often measured "emotional contagion" via the Emotional Contagion Scale, or by assessing the extent to which people mimic others' facial, vocal, and postural expressions and/or come to share others' emotions. The *Emotional Contagion Scale* was designed to assess people's susceptibility to “catching” the basic emotions of joy and happiness, love, fear and anxiety, anger, and sadness and depression, as well as emotions in general (see Doherty, 1997; Hatfield et al., 1994).

Possible Mechanisms of Emotional Contagion

Theoretically, emotions can be “caught” in several ways. Early investigators proposed that conscious reasoning, analysis, and imagination accounted for the phenomenon (Smith, [1759] 1966). Primitive emotional contagion, however, appears to be a far more subtle, automatic, and ubiquitous process than these early theorists supposed. There is considerable evidence in support of the following propositions (see also Hatfield, Cacioppo, & Rapson, 1994):

Proposition 1: Mimicry

In conversation and in face-to-face interaction, people automatically and continuously mimic and synchronize their movements with the facial expressions, voices, postures, movements, and instrumental behaviors of others.

Facial mimicry. The fact that people's faces often mirror the facial expressions of those around them is well documented (Hatfield, et al., 1994; Hess, Houde, & Fischer, this volume). Neuro-scientists and social-psycho-physiologists, for example, have found that people's cognitive responses (as measured by functional magnetic resonance imaging [fMRI] techniques: Rizzolatti & Craighero, 2004; Wild, Erb, Eyb, Bartels, & Grodd, 2003) and facial expressions (as measured by electromyography [EMG] procedures) tend to reflect the subtle moment-to-moment changes in the emotional expressions of those they observe. This motor mimicry is often so swift and so subtle that

it produces no observable change in facial expression (see Hatfield et al., 2009; Lundquist, 1995, for a summary of this research). Sato, Fujimura, and Suzuki (2008) studied Japanese college students' facial EMG activity as they observed videos or photographs of target persons who displayed happy or angry facial expressions. They found that the happy or angry target faces evoked very different EMG response patterns. When observing happy facial expressions, participants showed increased muscular activity over the *zygomaticus major* (cheek) muscle region. When observing angry facial expressions, they displayed increased muscular activity over the *corrugator supercilii* (brow) muscle region. These effects were stronger when students were observing dynamic expressions than when observing static expressions. A great deal of research has documented the fact that infants (Melzoff & Prinz, 2002), young children, adolescents, and adults automatically mimic other people's facial expressions of emotion (see Hatfield et al., 1994; Hurley & Chater, 2005; Lundquist, 1995, for a review of this research). For a review of the factors that shape the likelihood that people will (or will not) mimic others' emotional expressions, see Hess and Blair (2001), Hess and Bourgeois (2006), and Hess and colleagues (this volume).

Vocal mimicry. People have also been shown to mimic and synchronize vocal utterances. Normally, different people prefer different interaction tempos. When people interact, however, it is often the case that their speech cycles become more similar to one another's. There is a good deal of evidence from research in controlled interview settings that supports interspeaker influence in speech rates, utterance durations, and latencies of response (see Cappella & Planalp, 1981; Chapple, 1982).

Postural mimicry. Individuals have also been found to mimic and synchronize their postures and movements (Bernieri et al., 1991). We are probably not able to *consciously* mimic others very effectively: the process is too complex and too fast. For example, even world champion boxers like Muhammed Ali take about 230 milliseconds to detect a signal light to throw a punch in response. Yet, Condon and Ogston (1966) found that college students could synchronize their movements within 21 milliseconds (the time of one picture frame). Davis (1985) argues that microsynchrony is

mediated by brain structures at multiple levels of the neuraxis and is either “something you’ve got or something you don’t”; there is no way that one can deliberately ‘do’ it” (p.69). Those who consciously try to mirror others, he speculates, are doomed to look phony.

In sum, there is considerable evidence that people are capable of automatically mimicking and synchronizing their faces, vocal productions, postures, and movements with those around them. They do this rapidly, automatically mimicking and synchronizing a number of emotional characteristics in an instant (see Hatfield et al., 1994, and Hess et al., this volume, for a discussion of this research).

Proposition 2: Feedback

People’s emotional experience is affected, moment-to-moment, by the activation of and/or feedback from facial, vocal, postural, and movement mimicry.

According to Hatfield and her colleagues (1994), people’s emotional experience could be influenced by: (1) the central nervous system, which is responsible for initially directing mimicry/synchrony; (2) the afferent feedback from facial, verbal, or postural mimicry; or (3) conscious self-perception, whereby individuals make inferences about their own emotional states on the basis of their own expressive behavior. Given the functional redundancy that exists across levels of the neuraxis, all three processes may operate to insure that emotional experience is shaped by facial, vocal, and postural mimicry/synchrony and expression. Recent reviews of the literature tend to agree that emotions are tempered to some extent by facial, vocal, and postural feedback.

Facial feedback. Darwin ([1872] 2005) argued that people’s emotions should be profoundly affected by feedback from the facial muscles:

“The free expression by outward signs of an emotion intensifies it. On the other hand, the repression, as far as is possible of all outward signs, softens our emotions. He who gives way to violent gestures will increase rage; he who does not control the signs of fear will experience fear in a greater degree; and he who remains passive when overwhelmed with grief loses his best chance of recovering elasticity of mind” (Darwin, [1872] 2005, p. 365).

Social psychologists have tested the facial feedback hypothesis by using a variety of strategies to induce participants to adopt a specified facial expression. Examples of these strategies include simply asking participants to exaggerate or to try to hide any emotional reactions they might have, “tricking” participants into adopting a given facial expression, and arranging a situation so that participants will unconsciously mimic the emotional facial expressions of others. In all three designs, emotional experiences tend to be affected by the facial expressions adopted from others (Adelmann & Zajonc, 1989; Matsumoto, 1987). In one of the most intriguing set of experiments designed to test the facial feedback hypothesis, Neal and Chartrand (2011) studied the impact of facial feedback on amplifying or dampening emotions. In Experiment 1 they studied people who had recently received Botox injections (which paralyze facial muscles). They found that Botox patients were less good at identifying emotions than were their peers. In a second experiment, they applied a gel that made the skin resistant to underlying muscle contractions. In this situation participants were forced to exaggerate their reactions and, as predicted, emotion perception improved.

Ekman and colleagues (1983) have argued that facial feedback affects both emotional experience *and* autonomic nervous system (ANS) activity. In an experiment, they asked participants to produce six emotions (surprise, disgust, sadness, anger, fear, and happiness) either by remembering instances when they had experienced such emotions or by arranging their facial muscles in appropriate configurations. The authors found that the act of re-living emotional experiences or of flexing facial muscles into characteristic expressions produced reactions in the ANS that would normally accompany such emotions. Thus, facial expressions seemed to be capable of generating ANS arousal.

Vocal feedback. There is also evidence supporting the contention that subjective emotional experience is affected by the activation of and/or feedback from vocal mimicry. Hatfield and colleagues (1995) conducted a series of experiments designed to test the vocal feedback hypothesis. Participants were men and women of African, Chinese, European, Filipino, Hawaiian, Hispanic,

Japanese, Korean, Pacific Island, or mixed ancestry. The authors made every effort to disguise the fact that they were interested in the participants' emotions by claiming that Bell Telephone was testing the ability of various kinds of telephone equipment to reproduce the human voice faithfully. Participants were then led to private rooms and given a cassette tape containing one of six sound patterns, one a neutral control and the others corresponding to joy, love/tenderness, sadness, fear, and anger.¹ The five tapes were designed to exhibit the sound patterns appropriate to their respective emotions. Specifically, the joyous sounds had some of the qualities of merry laughter; the sad sounds possessed the qualities of crying; the companionate love tape consisted of a series of soft "ooohs" and "aaahs"; the angry tape comprised a series of low growling noises from the throat; and the fearful sounds included a set of short, sharp cries and gasps. Finally, the neutral tape was one long monotone, a hum, without any breaks.

Participants were asked to reproduce the sounds as exactly as possible into a telephone. Results revealed that participants' emotions were powerfully affected by the specific sounds they produced, thereby providing additional support for the vocal feedback hypothesis (for a summary, see Hatfield et al., 2009).

Postural feedback. Finally, there is evidence suggesting that emotions are shaped by feedback from posture and movement (see Hatfield et al., 1994, for a review). Interestingly, actor and theater director Konstantin Stanislavski noticed the connection between posture and performance (Moore, 1984). He argued: "Emotional memory stores our past experiences; to relive them, actors must execute indispensable, logical physical actions in the given circumstances. There are as many nuances of emotions as there are physical actions" (Morre, 1984, pp. 52–53).

¹ Communication researchers have documented that these basic emotions are linked with specific patterns of intonation, vocal quality, rhythm, and pausing. When people are happy, for example, they produce sounds with small amplitude variation, large pitch variation, fast tempo, a sharp sound envelope, and few harmonics.

Stanislavski proposed that we may relive emotions any time we engage in a variety of actions that were once associated with those emotions.

In sum: in a variety of studies, we find evidence that people tend to feel emotions consistent with the facial, vocal, and postural expressions they adopt. Currently, there is a serious debate as to the specificity of these linkages. Many social psychologists argue that the links between facial, vocal, and postural expression are quite specific: i.e., when people produce expressions of fear, anger, sadness, or disgust, they are more likely to feel not just any unpleasant emotion but the emotion associated with those *specific* expressions; for example, those who make a sad expression feel sad, not angry (see Duclos et al., 1989). Other prominent theorists dispute this. They argue that the linkages are not quite so specific. Some argue, for example, that the linkage is in terms of valence and arousal rather than on discrete emotions (see Russell, Bachorowski, & Fernandez-Dols, 2003, for an overview). Not surprisingly, since emotional contagion research is still in its infancy and of such popular interest, theorists are deeply divided about the details of how the process of contagion might work. Among the things that remain unclear, for example, are how important such feedback is (is it necessary, sufficient, or merely a small part of emotional experience?), how specific the linkages are, and exactly how the physical expression and the emotion are linked (Adelman & Zajonc, 1989; for a critical review, see Manstead, 1988). Only subsequent research will answer these questions.

Proposition 3: Contagion

As a consequence of mimicry and feedback, people tend, from moment-to-moment, to “catch” others’ emotions.

Scholars from a variety of disciplines (clinical observers, social psychologists, sociologists, neuroscientists and primatologists, life span researchers, and historians) provide evidence that people do in fact catch one another’s emotions frequently and universally and perhaps on a very large scale (Hatfield et al., 2009). Recently, discoveries in neuroscience have provided some insight

into *why* people so readily “catch” the emotions of others and how they come to empathize with other’s thoughts, emotions, and behaviors (see Hatfield, et al., 2009; Lamm & Silani, this volume).

Neuroscientists contend that certain neurons (commonly referred to as mirror neurons) fire when a certain type of action is performed *and* when primates observe another animal performing the same kind of action. Rizzolatti (2005) and his colleagues at the University of Parma monitored the brains of macaque monkeys when they observed another monkey performing an activity (like grasping a peanut). In doing so they made a fascinating discovery. They uncovered mirror neurons—a type of brain cell that responds the same way when monkeys (or humans) performed an action as when they merely witnessed another monkey (or human) performing the same action! Researchers have suggested that these brain structures could also be responsible for “mind-reading (understanding the intentions of others),” emotional contagion, and empathy in primates, including humans (see Blakemore & Frith, 2005; Glenberg, 2011; Iacoboni, 2005; Rizzolatti, 2005; Wild, Erb, & Bartels, 2001; Wild et al., 2003)

Summary

In theory, the process of emotional contagion consists of three stages: mimicry, feedback and contagion. People tend: (a) to automatically mimic the facial expressions, vocal expressions, postures, and instrumental behaviors of those around them, and thereby (b) to feel a pale reflection of others’ emotions as a consequence of such feedback. The result is that (c) people tend to catch one another’s emotions. Presumably, when people automatically mimic their companions’ fleeting facial, vocal, and postural expressions of emotion, they often come to *feel* a dim reflection of their companions’ actual emotions. By attending to this stream of tiny moment-to-moment reactions, people are able to “feel themselves into” the emotional lives of others. They can track the intentions

and feelings of others from moment-to-moment, even when they are not explicitly attending to this information.²

Emotional contagion is a delicate process. We feel a weak reflection of others' emotions on a constant basis. We must keep in mind, however, that powerful emotions can certainly override these delicate responses. Thus, when threatened by a fearsome mugger, for an instant we might sense (and reflect) his fury. But as our cognitive and experiential processes kick in, sheer terror will likely take precedence over anger.

Contagion and Emotions in Collectives

Thus far, we have focused on the work of social psychologists who have devoted their efforts to discovering the exact process by which *one person* transmits his or her emotions to one of his or her peers. Scholars from other disciplines, however, have been less interested in how emotion is transmitted person-to-person than in demonstrating how crowds of people often end up in a powerful emotional and/or behavioral synchrony. How does this happen? We naturally assume that the same processes that cause individuals to "catch" one another's emotions operate in crowds of people. One person (in trying times) sparks another's fear and panic, the two of them spark similar reactions in others, and so forth, until the whole community is in a tizzy. Thus, collectives often come to share thoughts, feelings, and hysterical behaviors. Whether or not this is true, we do not know. Only more research can tell. In any case, a variety of researchers have investigated the contagion of emotion and behavior of people in a variety of communities. In the following sections, we will review this research.

Contagion: Historical Examples

² Cognitive psychologists are engaged in a fierce and fruitful debate as to how important an understanding of intention is in understanding mimicry and its consequences. That debate is, of course, beyond the scope of this paper. People interested in this debate might consult Hurley & Chater (2005) for a review of this debate and relevant research on the topic.

There is considerable evidence that a variety of emotions are capable of affecting whole groups of people—especially when people are under stress. In the Middle Ages, in the wake of the Black Death, dancing manias swept throughout Europe. Klawans (1990) describes the “sorrow and anxiety” which drove people “to the point of hysteria”:

“[The bubonic plague, the infamous Black Death] appeared [in the 12th century.] . . . It . . . broke over Europe in a great wave. Entire villages were exterminated. Fields became neglected. Soon famine complicated the pestilence. And just as the plague receded and the population and economy began to recover, another wave struck. . . It was at that point that the dancing mania began and spread like a contagion. Today, most historians view this phenomenon as a form of mass hysteria” (Klawans, 1990: pp. 236–237).

One anonymous writer (reported in Hecker, [1837] 1970) described the 12th century madness this way:

“The effects of the *Black Death* had not yet subsided and the graves of millions of its victims were scarcely closed, when a strange delusion arose in Germany, which took possession of the minds of men, and, in spite of the divinity of our nature, hurried away body and soul into the magic circle of hellish superstition . . . It was called the dance of St. John or of St. Vitus, on account of the Bacchantic leaps by which it was characterized, and which gave to those affected, while performing their wild dance, and screaming and foaming with fury, all the appearance of persons possessed. It did not remain confined to particular localities, but was propagated by the sight of the sufferers, like a demoniacal epidemic, over the whole of Germany and the neighboring countries to the northwest . . .” (Hecker, [1837] 1970: Ch. I, Section 1).

A variety of historians went on to explain: dancers abandoned all reason. They shrieked and cried as their minds were possessed by spirits and horrific visions. Sometimes, glory to God, the heavens rent apart and the Savior and the Virgin Mary descended to earth on a wave of heavenly

music. Sometimes they found themselves swept up in a cascade of blood. Often the mania began or ended with epileptic convulsions.

The dancing mania spread from town to town. In Cologne, 500 joined the wild revels; in Metz, 1,100 danced. Priests tried to exorcise the devils. Sufferers traveled to the Tomb of Saint Vitus in southern France to be cured. Paracelsus, a 16th century physician and alchemist, devised a harsh but effective treatment for the dancing mania: He dunked the victims in cold water, forced them to fast, and condemned them to solitary confinement. The hysterical outbreaks began to subside.

Historically, religious ecstasy has been common. Traveling in the mid-19th century, for example, Frederick Law Olmsted observed a black Christian service in New Orleans and was swept up by the “shouts, and groans, terrific shrieks, and indescribable expressions of ecstasy—of pleasure and agony,” to the point where he found his own face “glowing” and his feet stamping, as if he had been “infected unconsciously” (quoted in Ehrenreich, 2006: p. 3). Today, any celebrant at a religious tent revival can share Olmsted’s experience.

“Civilized people” often look down upon such collectivist expressions of ecstasy—labeling such passion as a “disgusting and fiendish saturnalia,” “hideous, hellish practices,” “insane possession,” or “hysteria.” Nonetheless, such contagious collective joy has existed in all societies, in all times, and in all places. Historian Ehrenreich (2006), in *Dancing in the Streets: A History of Collective Joy*, provides a vivid review of the power of the contagious and collective ecstasy that has oft’ swept communities.

Historians have documented a multitude of cases of emotional contagion sparking collective joy and mania (Ehrenreich, 2006), political and revolutionary passion (Hatfield & Rapson, 2004; Rude, 2005), religious frenzies (Ehrenreich, 2006), anger and hatred, senseless riots and violence (Church, 1964; McCague, 1968), and fear and panic (Bernstein, 1990; Cook, 1974; Headley, 1971; Lefebvre, 1973). The sweep of these historical narratives make for compelling reading. One need only think of Hitler’s mass Nuremburg rally, or inflamed Arab crowds screaming “Death to Israel.

Death to America,” to sense the danger of emotional contagion. Or, on a much lighter note, the wild ecstatic joy of players who just won the World Series, or teenagers at a Lady GaGa or Justin Bieber concert. These examples are all around us, and are often consequential historically. Psychologists studying emotional contagion have focused their efforts almost entirely on figuring out how this process occurs. When discussing the practical implications of such contagion, they mention "mind reading," "social coordination," and the like. When we step back and take a historical, cultural, anthropological, sociological, or medical perspective, we see that (regardless of how such contagion operates) and whatever we call the contagion—be it called hysterical contagion, the madness of crowds, or mass psychogenic illness—it is evidence of how powerful the collective process is.

Emotional Contagion: Cultural and Anthropological Examples

Tseng and Hsu (1980) defined mass hysteria as: “A sociocultural-psychological phenomenon in which a group of people through social contagion, collectively manifest psychological disorders within a brief period of time” (p. 77). Anthropologists (Czaplicka, 1914) provide detailed documentation of such contagion, including “arctic hysteria” or “mimicry mania” in northern Asia. One author, Czaplicka (1914), summarizes several reports:

“In a Middle Vil[yui River] village, Maak knew many Yakut women suffering from a very common disease which shows itself in the patients imitating all the gestures and words of bystanders, whatever their meaning, which was sometimes quite obscene. . . . He quotes also an episode which was related to him by Dr. Kashin, who was much interested in this disease. Once, during a parade of the 3rd Battalion of the Trans-Baikal Cossacks, a regiment composed entirely of natives, the soldiers began to repeat the words of command. The Colonel grew angry and swore volubly at the men; but the more he swore, the livelier was the chorus of soldiers repeating his curses after him” (p. 313)

Relief may be equally contagious. Watson (1976) describes the case of an Indonesian who ran *amok* once or twice a month. He would be seized by a sudden vision and run through the

village, his eyes bulging and his hair standing on end. In the temple he would alternately scream defiance, hack at the air in panic, or crouch, whimpering in pain. Finally, he was emotionally spent. There was a sudden stillness, and then:

“Naum stood and looked at the crowd on the beach. He smiled tentatively. The people smiled back. Naum giggled, and a wave of response moved through the crowd. Naum grinned. The people beamed. Naum offered a laugh, and it came out rather high and shaky, as though it were something he had never tried before. . . . Then Naum burst into a great roar of laughter, a huge sound that flooded out on a tide of release, and suddenly all the others were laughing together, holding on to each other, staggering around the beach, collapsing in heaps, laughing until the tears ran down their cheeks” (p. 132).

Cross-cultural scholars and anthropologists have documented many examples of the contagion of emotions and strange behavior in collectives (see Hatfield, et al., 1994, for a review of this voluminous research.)

Hysterical Contagion: Sociological Examples

In 1962, Kerckhoff and Back (1968) watched a drama unfold. The first reports on the six o'clock news suggested that a mysterious epidemic had hit a Montana factory:

“Officials of Montana Mills shut down their Strongsville plant this afternoon because of a mysterious sickness. According to a report just in from Strongsville General Hospital, at least ten women and one man were admitted for treatment. Reports describe symptoms as severe nausea and breaking out over the body. Indications are that some kind of insect was in a shipment of cloth that arrived from England at the plant today. And at the moment the bug is blamed for the outbreak of sickness” (p. 3).

The mysterious illness soon raced through the plant. In a few weeks, more than 59 women and three men in the 965-person plant were stricken with the mysterious illness, characterized by panic, anxiety, nausea, and weakness. Experts from the U. S. Public Health Service Communicable Disease Center and university entomologists were brought in. The vast textile plant was vacuumed

for specimens. The total catch consisted of one black ant, a housefly, a couple of gnats, a small beetle, and one mite. Nonetheless, the plant was fumigated. In the end, scientists concluded that hysterical contagion had sparked the epidemic.

To find out which workers had been susceptible to hysterical contagion, and why, Kerckhoff and Back (1968) conducted a series of interviews. They talked to those who had fallen ill, to those who had not, and to those who had witnessed the epidemic. They also studied medical records. Their conclusions were along these lines:

1. Workers were most likely to catch the “disease” if they had been under severe stress at the time the “epidemic” struck. Women were most susceptible if they were experiencing marital problems, if they were responsible for supporting their families, felt trapped, and were overworked and exhausted at the time the epidemic hit. Workers were especially vulnerable if they lacked coping skills. Women did not catch the disease if they did not have the “luxury” of falling ill. Women who had job security quickly succumbed. Women who reported needing a job desperately, who felt insecure about their abilities, were straining to produce, who felt obligated to keep their job at any cost, and were worried about being laid off did not get sick.

2. Initially, the majority of the victims were social isolates, who had a history of “nervousness” and fainting. Once the panic began to spread, however, workers were most likely to catch the disease if they had close emotional ties with the other “infected” workers. Women who were members of other social groups, social isolates, or outsiders (either because they were black, new at the plant, or because their workstations separated them geographically from the victims) did not get sick. Many such women, in fact, were often so little touched by the epidemic that they were skeptical that an “epidemic” had ever existed.

Such “epidemics” have been documented throughout the world. In Singapore in 1973, for example, workers at a large television factory suddenly became hysterical. Some had seizures; they fell into a trance state, screamed and cried, sweated, and struggled violently (swinging their upper limbs and kicking about). More became frightened. They complained of dizziness, numbness, and

faintness. Physicians gave the workers Valium and Chlorpromazine and sent them home.

They calmed down, but the hysteria quickly spread to other factories (Chew, Phoon, & Mae-Lim, 1976). Such mass hysteria is common today (Dominus, 2012; McKenzie, 2012). Even the most sophisticated medical techniques generally can find nothing wrong.

Emotional Contagion: Clinical Examples

Recently, researchers from several universities examined whether mathematical models, developed to predict the spread of a variety of infectious diseases, could also be applied to the spread of emotions—such as happiness, anxiety and depression, or loneliness. They concluded that these emotions are as contagious as the most virulent of infectious diseases.

Joy, happiness, and enthusiasm. In a study of nearly 5,000 individuals who participated in the Framingham Heart Study from 1948 until the present, it was found that happiness and enthusiasm spreads through social networks of family, friends, neighbors, and the wider community much like other infectious diseases (Cristakis & Fowler, 2011; Hill, Rand, Nowak, & Christakis, 2010).

Anxiety, depression, and loneliness. Clinicians have long known that anxiety and depression are contagious. Coyne (1976), for example, invited University of Pennsylvania students to participate in a study examining the process by which people get acquainted. They were instructed to call a woman, located somewhere in Ohio, and chat with her on the telephone for 20 minutes. The woman with whom they chatted was, unbeknownst to them, either known to be depressed or non-depressed. Dealing with someone's depression took a toll. Those who spoke with a depressed woman became aware that she was sad, weak, passive, and in a low mood. They came away from the encounter feeling more depressed, anxious, and hostile than before, and were not eager to talk to her again. Participants who talked to a non-depressed woman naturally did not have such disagreeable reactions. Similar results were found by Howes, Hokanson, and Lowenstein (1985). Medical researchers have also found that contagion sparks such collective emotions as loneliness (Cacioppo, Fowler, & Christakis, 2009; Cristakis & Fowler, 2011).

Originally, the theory of emotional contagion was designed to predict the way in which individuals (senders) transmit their emotions to others (receivers) one-to-one. Historians and sociologists have generally focused not on charting the individual and interindividual stages in this process but simply on documenting its existence—i.e. on documenting that emotional contagion does in fact exist. In addition, they have been interested in the way that a person (or groups of people) can transmit their emotions to whole communities. .

Emotional Contagion: Medical Examples

In the last few years, epidemiologists have begun to study mass psychogenic illnesses (where symptoms rapidly appear in groups of people through social contagion) and the transmission via contagion of a variety of diseases. Some of these scholars assume that intellectual or emotional contagion underlies such transmission. Others do not specify the process underlying such transmission—merely making an analogy with the vast literature on contagion. We will consider these views below.

The Contagion of Obesity

Christakis and Fowler (2011) garnered a great deal of attention when they proposed that social contagion predicted that obesity can spread through a social network, just like viruses spread, because people “infect” others with their perceptions and habits. They examined data from the Framingham Heart Study, described earlier. Among the participants, obesity had increased from 14% in the 1970s to 30% in 2000. Based on their data, they found that the rapid increase in obesity rates was due largely to social network influence. Of course other factors influence obesity, such as access to unhealthy food and a sedentary lifestyle. Nonetheless, it was contagion that was the most powerful determinate of weight. The authors found that if you were, for example, obese, those with whom you had close contact were likely to become obese, too. Specifically, a typical American has a two percent chance of becoming obese in any given year. The probability rises by .4 percent with each obese social contact one has. So if one has five obese friends, that doubles one’s risk of becoming obese. The authors’ flamboyant statements: “Your colleague’s husband’s sister can make

you fat, even if you don't know her," naturally garnered worldwide press attention. In its wake came several statistical critiques (see Kolata, 2011). Researchers have also found that smoking, sleep problems, illegal drug use, depression, and divorce are contagious too (Christakis & Fowler, 2011). Whatever its merit, the authors' research provoked a great deal of medical research designed to trace the epidemiology of various diseases.

Conclusions

In this chapter we have traced the role of emotional contagion theory in explicating the spread of collective emotions. Early sociologists such as Gustav Le Bon (1896) sparked an interest in the "group mind" and the "madness of crowds." They explored the process of hysterical contagion in a variety of societies and natural settings. In the 1970s, however, social psychologists proposed a theory of emotional contagion, focused on individuals rather than crowds. They attempted to pin down the process by which one individual transmits his or her emotions to another person or small group. Today, however, clinicians, psychologists, physicians and epidemiologists, echoing LeBon, have begun to apply Emotional Contagion Theory to collective emotions and the social contagion of various mental and physical diseases. We concluded this chapter by reporting on the new and compelling research documenting that, under a variety of conditions, partners and even entire communities may catch their fellows' moods and emotions. The list of emotions and behaviors subject to contagion is long. It includes joy and happiness, depression, and loneliness; physical problems, such as allergies, obesity, reactions to chemical spills and environmental hazards, and the like; and social and health related problems, such as smoking, sleep problems, illegal drug use, depression, and divorce. Contagion theory seems to be opening many doors to better understanding human behavior.

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