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Whoever battles with monsters had better see that it does not
turn him into a monster. And if you gaze long into an abyss,
the abyss will gaze back into you.

—Nietzsche—

Emotional Contagion and Empathy

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Today, there are many definitions of empathy. Most clinical and counseling psychologists, however, agree that true empathy requires three distinct skills: the ability to share the other person's feelings, the cognitive ability to intuit what another person is feeling, and a "socially beneficial" intention to respond compassionately to that person's distress (Decety & Jackson, 2004). In this chapter, we will deal primarily with the second of these processes: the ability of people to "feel themselves into" another's emotions via the process of emotional contagion.

Primitive Emotional Contagion

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 to share the feelings of others. In this chapter, we plan to discuss what is known about this crucial component of empathy. We begin by defining "primitive emotional contagion" and discussing three mechanisms that may account for this pervasive phenomenon.

Theoretical Overview

Emotional contagion is best conceptualized as a multiply determined family of social, psychophysiological, and behavioral phenomena. Theorists disagree as to what constitutes an emotion family. Most, however, would agree that emotional “packages” are comprised of 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).

Hatfield, Cacioppo, and Rapson (1994) define primitive *emotional contagion* as:

The tendency to automatically mimic and synchronize facial expressions, vocalizations, postures, and movements with those of another person's and, consequently, to converge emotionally (p. 5).

The *Emotional Contagion Scale* was designed to assess people's susceptibility to “catching” 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). The *ECS* has been translated into a variety of languages, including Finnish, German, Greek, Indian, Japanese, Portuguese, and Swedish. For information on the reliability and validity of this scale, see Doherty, 1997).

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. For example, the economic philosopher Adam Smith (1759/1966) observed:

Though our brother is upon the rack . . . by the imagination we place ourselves in his situation, we conceive ourselves enduring all the same torments, we enter as it were into his body, and become in some measure the same person with him, and thence form some idea of his sensations, and even feel something which, though weaker in degree, is not altogether unlike them (1759/1966, p. 9).

However, primitive emotional contagion appears to be a far more subtle, automatic, and ubiquitous process than theorists such as Smith supposed. There is considerable evidence, for instance, in support of the following propositions:

I. Mimicry

Proposition 1: In conversation, people automatically and continuously mimic and synchronize their movements with the facial expressions, voices, postures, movements, and instrumental behaviors of others.

Scientists and writers have long observed that people tend to mimic the emotional expressions of others. As early as 1759, Adam Smith (1759/1966) acknowledged that as people imagine themselves in another's situation, they display "motor mimicry."

When we see a stroke aimed, and just ready to fall upon the leg or arm of another person, we naturally shrink and draw back on our leg or our own arm (1759/1966, p. 4).

Smith felt that such imitation was "almost a reflex." Later, Theodor Lipps (1903) suggested that conscious empathy is attributable to the instinctive "motor mimicry" of another person's expressions of affect.

Since the 1700s, researchers have collected considerable evidence that people do tend to imitate others' emotional expressions.

A. Facial Mimicry

The fact that people's faces often mirror the facial expressions of those around them is well documented (Dimberg, 1982; Vaughan & Lanzetta, 1980). Some representative examples are described below: Neuro-scientists and social-psychophysicists, for example, have found that people's cognitive responses (as measured by fMRI techniques) and facial expressions (as measured by EMG procedures) tend to reflect the most subtle of moment-to-moment changes in emotional expressions of those they observe (Wild, et al., 2003). This motor mimicry is often so swift and so subtle that it produces no observable change in facial expression (Lundqvist, 1995.)

Lars-Olov Lundqvist (1995) recorded Swedish college students' facial EMG activity as they studied photographs of target persons who displayed happy, sad, angry, fearful, surprised, and disgusted facial expressions. He found that the various target faces evoked very different EMG response patterns. When participants observed happy facial expressions, they showed increased muscular activity over the *zygomaticus major* (cheek) muscle region. When they observed angry facial expressions, they displayed increased muscular activity over the *corrugator supercilii* (brow) muscle region.

A great deal of research has documented the fact that infants (Meltzoff & Prinz, 2002), young children, adolescents, and adults automatically mimic other person's facial expressions of emotion (see Hatfield, et al., 1994; Hurley, & Chater, 2005b 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 & Blair, 2001; Hess & Bourgeois, 2006.)

B. Vocal Mimicry

People have also been shown to mimic and synchronize vocal utterances. Different people prefer different interaction tempos. When partners interact, if things are to go well, their speech cycles must become mutually entrained. There is a good deal of evidence in controlled interview settings supporting interspeaker influence in speech rates, utterance durations, and latencies of response (see Cappella & Planalp, 1981; Chapple, 1982.)

C. Postural Mimicry

Individuals have also been found to mimic and synchronize their postures and movements (Bernieri, et al., 1991) (See Hatfield, et al., 1994, for a summary of this research).

We are probably not able *consciously* to mimic others very effectively: the process is simply too complex and too fast. For example, it took even the lightning fast Muhammed Ali a minimum of 190 milliseconds to detect a signal light and 40 milliseconds more to throw a punch in response. Yet, William Condon and W. D. Ogston (1966) found that college students could synchronize their movements within 21 milliseconds (the time of one picture frame). Mark 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 try consciously to mirror others, he speculates, are doomed to look “phony.”

In sum, there is considerable evidence that people are capable of automatically mimicking/synchronizing their faces, vocal productions, postures, and movements with those around them. They do this with startling rapidity, automatically

mimicking/synchronizing a surprising number of emotional characteristics in a single instant (Condon, 1982).

II. Feedback

Proposition 2: Participants emotional experience is affected, moment-to-moment by the activation and/or feedback from facial, vocal, postural, and movement mimicry.

Theoretically, participants' emotional experience could be influenced by: (1) the central nervous system commands that direct such mimicry/synchrony in the first place; (2) the afferent feedback from such facial, verbal, or postural mimicry/synchrony; or (3) conscious self-perception processes, wherein 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.

A. Facial Feedback

Darwin (1872/2005) argued that emotional experience 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 (p. 365).

Researchers have tested the facial feedback hypothesis, by using a variety of strategies to induce participants to adopt emotional facial expressions. First, they sometimes simply ask participants to exaggerate or to try to hide any emotional reactions they might have. Second, they sometimes try to “trick” participants into adopting various facial expressions. Third, they sometimes arrange things so participants will unconsciously mimic the emotional facial expressions of others. In all three types of experiments, the emotional experiences of people tend to be affected by the facial expressions they adopt (Adelmann & Zajonc, 1989; Matsumoto, 1987.)

In a classic experiment, James Laird and Charles Bressler (1992) told participants that they were interested in studying the action of facial muscles. Their experimental room contained apparatus designed to convince anyone that complicated multichannel recordings were about to be made of facial muscle activity. Silver cup electrodes were attached to the participants' faces between their eyebrows, at the corners of their mouths, and at the corner of their jaws. These electrodes were connected via an impressive tangle of strings and wires to electronic apparatus (which, in fact, served no function at all.) The experimenter then proceeded surreptitiously to arrange the faces of the participants into emotional expressions. The authors found that emotional attributions *were* shaped, in part, by changes in the facial musculature. Participants in the “frown” condition reported being less happy (and more angry) than those in the “smile” condition. The participants' comments give us some idea of how this process worked. One man said with a kind of puzzlement:

When my jaw was clenched and my brows down, I tried not to be angry but it just fit the position. I'm not in any angry mood but I found my thoughts wandering to things that made me angry, which is sort of silly I guess. I knew I was in an experiment and knew I had no reason to feel that way, but I just lost control (p. 480).

Paul Ekman and his colleagues (1983) have argued that both emotional experience *and* autonomic nervous system activity are affected by facial feedback. They asked people to produce six emotions—surprise, disgust, sadness, anger, fear, and happiness. They were to do this either by reliving times when they had experienced such emotions or by arranging their facial muscles in appropriate poses. The authors found that the act of reliving emotional experiences or flexing facial muscles into characteristic emotional expressions produced effects on the ANS that would normally accompany such emotions. Thus, facial expressions seemed to be capable of generating appropriate ANS arousal.

B. Vocal Feedback

There also exists an array of evidence supporting the contention that subjective emotional experience is affected, moment-to-moment, by the activation and/or feedback from vocal mimicry (Duclos et al., 1989; Hatfield, et al, 1994 and 1995; Zajonc, et al., 1989).

Elaine Hatfield and her 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 hide the fact that they were interested in the participants' emotions. (They claimed that Bell Telephone was testing

the ability of various kinds of telephone systems to reproduce the human voice faithfully.) Participants were then led to private rooms, where the experimenter gave them a cassette tape containing one of six sound patterns (joy, love/tenderness, sadness, fear, anger, or a neutral control pattern).

Communication researchers have documented that the 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. In the study by Hatfield and her colleagues (1995), the first five tapes were therefore designed to possess 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 contained 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 in the predicted ways by the specific sounds participants produced. This experiment therefore provided additional support for the vocal feedback hypothesis.

C. Postural Feedback

Finally, evidence exists suggesting that emotions are shaped by feedback from posture and movement (see Bernieri, et al, 1988; Duclos et al., 1989; and Hatfield, et al., 1994 for a review of this research.) Interestingly enough, the theorist of theater,

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 (p. 52-53).

Stanislavski proposed we may relive emotions any time we engage in a variety of small actions that were once associated with these emotions. Whether or not Stanislavski was correct, there exists an array of evidence supporting the contention that subjective emotional experience is affected, moment-to-moment, by the activation and/or feedback from facial, vocal, postural, and movement mimicry.

In sum: in a variety of studies, then, we find evidence that people tend to feel emotions consistent with the facial, vocal, and postural expressions they adopt. The link between facial, vocal, and postural expression appears to be quite specific: when people produce expressions of fear, anger, sadness, or disgust, they are more likely to feel the emotion associated not just with any unpleasant emotion but with those *specific* expressions; e.g., those who make a sad expression feel sad, not angry (see Duclos, et al., 1989). What remains unclear is how important such feedback is (is it necessary, sufficient, or merely a small part of emotional experience?) and exactly how the two are linked (see Adelman & Zajonc, 1989). (For a critical review of this literature see Manstead, 1988).

III. Contagion

Proposition 3: Consequently, people tend, from moment-to-moment, to “catch” others' emotions.

Researchers from a variety of disciplines have provided evidence in support of this contention.

Recently, discoveries in neuroscience have provided some insight into *why* people so readily “catch” the emotions of others and why it is so easy to empathize with other people’s thoughts, emotions, and behaviors. Some examples:

Neuroscientists contend that certain neurons (canonical neurons) provide a direct link between perception and action. Other types of neurons (mirror neurons), fire when a certain type of action is performed *and* when primates observe another animal performing the same kind of action. Scientists propose that such brain structures might account for emotional contagion and empathy in primates, including humans (see Iacoboni, 2005; Rizzolatti, 2005; Wild, *et al.*, 2001, 2003.)

(The real question, of course, is “What is the sequential order of mirror neuron firing and mimicry?” Iacoboni and his colleagues contend that their monkeys are “doing nothing”—simply observing the other animal—when the mirror neuron firing occurs. We know that this is not so. At every instant, the primate is mimicking the stimulus person’s (or monkey’s) face, voice, posture, etc. Depending on the timing, the mirror neuron firing may *cause* the monkey’s mimicked grasping OR the animal’s mimicked grasping may cause the firing in the location under study (i.e., The same brain areas may fire when an animal *intentionally* performs an activity and when he performs it via mimicry. Only subsequent research will tell. Both processes, of course, would be of great interest to emotional contagion researchers.)

Blackemore and Frith (2003) have argued that imagining, observing, or in any way preparing to perform an action excites the same motor programs used to execute that same action. They review a great deal of recent research demonstrating that, in humans,

several brain regions (specifically the premotor and parietal cortices) are activated both during action generation and during the observation of others' actions. The premotor resonance was not dependent on the motive having a goal, whereas the parietal cortex was activated only when the action was directed toward a goal. Some have argued that this mirror system allows us to plan our own actions and also to understand the actions of others.

In the 1950s, primatologists conducted a great deal of research indicating that animals do seem to catch others' emotions. R. E. Miller and his colleagues (Miller, Banks, & Ogawa, 1963), for example, found that monkeys often transmit their fears to their peers. The faces, voices, and postures of frightened monkeys serve as warnings; they signal potential trouble. Monkeys catch the fear of others and thus are primed to make appropriate avoidance responses. Ethologists argue that the imitation of emotional expression constitutes a phylogenetically ancient and basic form of intraspecies communication. Such contagion also appears in many vertebrate species, including mice (Brothers, 1989; Mogil, 2006).

Scholars from a variety of disciplines provide evidence that people do in fact catch one another's emotions: there is evidence from clinical observers (Coyne, 1976), social-psychologists and sociologists (Hatfield, et al., 1994; Le Bon, 1896; Tseng & Hsu, 1980), neuroscientists and primatologists (Hurley & Chatter, 2005a; Wild, et al., 2003), life span researchers (Hurley & Chatter, 2005a and b), and historians (Klawans, 1990) suggesting that people may indeed catch the emotions of others at all times, in all societies, and perhaps on very large scales. (See Hatfield, et al., 1994; Wild, 2001, 2003, for a summary of this research.)

IV. 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. (c) The result is that 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 pale 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 moment-to-moment, even when they are not explicitly attending to this information.

Implications of Existing Research

In this chapter we confront a paradox. People seem to be capable of mimicking others' facial, vocal, and postural expressions with stunning rapidity. As a consequence, they are able to feel themselves into those other emotional lives to a surprising extent. And yet, puzzlingly, most people seem oblivious to the importance of mimicry/synchrony in social encounters. They seem unaware of how swiftly and how completely they are able to track the expressive behaviors and emotions of others.

What are some implications of recent findings concerning the nature of contagion and empathy? The research on contagion underscores the fact that we use multiple means to gain information about others' emotional states: Conscious analytic skills can certainly help us figure out what makes people “tick”. But if we pay careful attention to the emotions we experience in the company of others, we may well gain an extra edge

into “feeling ourselves” into the emotional states of others. Both of these means provide valuable information. In fact, there is evidence that both what we *think* and what we *feel* may provide valuable, but different, information about others. In one study, for example, Christopher Hsee and his colleagues (1992) found that people's conscious assessments of what others “must be” feeling were heavily influenced by what the others *said*. People's own emotions, however, were more influenced by the others' non-verbal clues as to what they were really feeling.

Proposed Questions Concerning Primitive Emotional Contagion and Empathy

In recent years, emotional contagion has been cited to explain the thoughts, feelings, and behavior of people in general, and, more specifically of autistic children (Decety & Jackson, 2004; Hurley & Chater, 2005a and b), music lovers (Davies, 2006), religious fanatics, terrorists, and suicide bombers (Hatfield & Rapson, 2004), suicides, and people in crowds (Adamatzky, 2005; Fischer, 1995)—to name just a few. What scientists haven't yet done is explore some of the basic questions as to who is susceptible to (or resistant to) emotional contagion and under what conditions. We will close by identifying a number of important questions that remain to be answered in understanding this important component of empathy—primitive emotional contagion.

- (1) What kinds of *people* are most vulnerable to catching others' emotions?
- (2) In what kinds of *relationships* are people most vulnerable to contagion?
- (3) What are the advantages (or disadvantages) of possessing the power to “infect” others with one's own emotions? What are the advantages (disadvantages) of possessing the sensitivity to read and reflect others' emotions?

(4) Are people better liked when they possess a natural tendency to mimic others' emotional expressions and behaviors? What happens when people consciously *try* to imitate others' emotional expressions and behaviors? Does that make people like them better or worse—since their performance will always be a little bit “off?”

(5) Can people be taught to be more in tune with others' emotions (i.e., becoming *more* susceptible to emotional contagion?)

(6) Can people be taught to resist being overwhelmed by others' emotions (i.e., becoming *less* susceptible to emotional contagion?)

The answers to these questions await the attention of researchers for whom the study of emotional contagion has acquired its own contagious appeal.

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