

# Interacting bodies and interacting minds\*

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## Abstract

The paper defines the notions of induction, transmission, expression and communication of emotion, and finally contagion and empathy. It singles out their similarities and differences according to a model in terms of goals and beliefs. Given the usefulness of emotion induction in social influence, different types of deception about emotions are reviewed and exemplified.

**Key Words:** *Emotions, social influence, contagion, empathy, deception*

## 1. Emotions from mind to mind

The end of the last millennium and the beginning of the new one has seen a revival in interest in research on emotion. Perhaps as a reaction to the heavy stress on the intellect processes, or due to an attempt to apply the cognitive approach to the analysis of “warmer” issues, theoretical and empirical research in the cognitive processes linked to emotions is flourishing. Among others, two important lines of study caused this growing interest. On the one hand, the discovery of mirror neurons (Rizzolatti et al., 1997; Carr et al., 2003) has revealed unexpected lines of research on imitation, communication, emotional contagion and empathy; on the other hand, research on Embodied Agents has shown the possibility to simulate all kinds of human behaviour in a virtual world, Natural Language, interaction capacities, nonverbal communication, variation due to style, culture, emotion. However, in these, as in all other research domains, to draw rigorous conceptual distinctions among the ways in which emotion flows from mind to mind can help theoretical understanding and formal annotation, finally leading to a better account, and to a finer grained simulation of these phenomena in Embodied Agents.

In this paper, starting from a model of emotions in terms of goals and beliefs, I define the notions of induction and transmission, expression and communication, contagion and empathy of emotions, and discuss some issues relative to truthful and deceptive expression, and communication of emotions.

## 2. Nature and function of emotions

An emotion is a multifaceted subjective state, encompassing cognitive, physiological, expressive, motivational aspects, and pleasant or unpleasant feelings, which is triggered when an adaptively important goal of an Agent is, or is likely to be, achieved or thwarted (Castelfranchi, 2000). Thus emotions have a very important adaptive function in that they warn our whole mind and body of an event that is relevant to our goals, and allow us to express our feelings and to perform possibly adequate actions to cope with the situation (Frijda, 1986). Moreover, thanks to their motivating power (they trigger goals of high urgency and importance) emotions are a strong weapon for persuasion and social influence (Poggi, 2005). This is why the induction of emotions in other people is a very frequent and relevant process of social interaction.

## 3. Induction of emotions

I define induction of emotion as the fact that in an Agent B a belief about an Agent A causes an emotion E.

The belief that induces an emotion may concern an event that occurs to A (for example, *A stumbles down and B worries about her*); or a feature of A (*A is so beautiful that B falls in love with her*); an action (*A suddenly arrives behind B and B is scared; A does a funny thing and B enjoys it*; a communicative action (*A tells B that B has won a competition, and B exults*), or finally an emotion of A (*A is happy for winning a competition, and B is happy too*).

Apart from the case in which an emotion is induced in B by an event that occurred to A, where the emotion induction is necessarily a bare effect of this event, in all other cases the emotion felt by B can be either simply an effect, either predicted or not, but not wanted by A, or a goal of A. So, in many cases, when what causes an emotion in B is an action of A (for example, if *A suddenly arrives behind B and B is scared*) the emotion induction in B is a bare effect, not a deliberate goal.

However, even a communicative action may not have the goal of causing an emotion to B, and yet have the effect of inducing one: for example if *A inadvertently tells B something which is bad news for B, and B becomes sad*. Or else, B may feel an emotion because she sees A feeling one, even if A, while expressing it, did not want to transmit it. In other cases, A really has the goal of having B feel an emotion: *she goes "booh!" to scare him, she hides an object to make him angry, she does something funny to amuse him* (action); or else, *she gives him bad news to have him suffer, tells a joke to make him laugh* (communicative action); or finally, *she shows sad to elicit compassion* (emotion).

Not always does knowing of another's emotion induce an emotion in us: there is not a reciprocal one-to-one correspondence, a necessary cause-effect relationship between knowing of others' emotions and feeling emotions; but quite often this is the case.

In this paper I analyse the cases in which induction of an emotion in B is caused by a belief about an emotion of A.

How can we know the Other is feeling an emotion ? There are three ways to come to have a belief about another's emotion: through expression, communication, and inference.

#### 4. Communication of emotions

According to the model of communication I adopt (Castelfranchi & Parisi, 1980; Conte & Castelfranchi, 1995; Poggi & Magno Caldognetto, 1997; Castelfranchi & Poggi, 1998; Poggi, 2006; 2007 a), a process of communication, in a general sense, takes place when:

- an Agent A has the goal G that another Agent B come to have the belief K
- in order to achieve goal G, A produces a signal *s* that A believes is linked to belief K (the Meaning of signal *s*), both in A's and in B's minds, according to a Communication System CS
- the signal *s* is a behaviour or a morphological trait that is produced by A in some productive modality (by some organs of A's body) and can be perceived by B in some receptive modality (visual, auditory, olfactory...)
- a Communication System is a set of rules to put signals and meanings in correspondence.

Since the notion of goal used in this model is a very abstract notion of a regulatory state (Miller, Galanter & Pribram, 1960), that is, simply a state that determines action, A's goal G of communicating belief K is not necessarily a deliberate and conscious goal. First, it may be either an *internal* goal of an individual agent or an *external* goal (Castelfranchi, 1981), one impinging on an Agent for the sake of biological functions or social ends. Some communicative signals are governed by biological goals, like blushing in humans, or the dance of bees; others are determined by the

social ends of communicating one's social role or social belonging, like a cop's uniform, or an adolescent's piercings.

Moreover, even an individual's internal goal of communicating may be represented at different levels of consciousness. For example, my goal of communicating is *conscious* if I am angry with a friend of mine and I tell him: "I am very angry with you"; it is *unconscious* if I consciously do not want to show anger to my friend, but inadvertently I pull a long face with him; and it is a *tacit* communicative goal when I emphasize the comment of my discourse with baton gestures, or by raising my eyebrows.

Given this general definition of communication, there are at least three ways in which an Agent A can explicitly transmit to another Agent B the belief K that she is feeling an emotion: 1. communication in a strong sense, 2. communication in a weak sense, and 3. expression.

#### 4.1. Communication in a strong sense

We have communication of emotion in a strong sense when

- A is feeling an emotion E
- A has the goal that B know that A is feeling E
- A is aware that A has the goal that B know of A's emotion
- A has the goal that B know that A has the goal that B know A is feeling E
- A produces a communicative signal CSE of emotion E

Emotion communication (in a strong sense) holds when A feels an emotion and has the goal for B to know that A is feeling it, but also has the goal for B to know that A has the goal of letting him know A feels E; and this is possible because A is conscious of her goal of having B know of her emotion. In order to achieve this goal, A produces a communicative signal of emotion. For example, *a teacher, really happy to meet her colleague, tells her: "I am happy to see you"*. Here A has the goal for B to know that A is feeling an emotion, but it is not sufficient for her that B simply knows this, she also wants it to be herself who lets B know, and furthermore wants to let B know it is just A who wants him to know it.

Emotion communication in the strong sense always and necessarily holds in the verbal communication of emotions. In verbal languages (Poggi & Magno Caldognetto, 2004), when we communicate our emotions we can provide information about three kinds of contents:

1. that we are feeling some emotion
2. which emotion we are specifically feeling
3. what was the event that caused it.

And we can do this by exploiting different communicative resources, singularly or in combination:

- a. lexical resources (nouns, verbs, adverbs, interjections that mention emotions)
- b. syntactic resources (for example, emphatic constructions using left-dislocation)
- c. morphological resources (like diminutives to communicate tenderness, deprecatories to communicate contempt)
- d. phonological (segmental and suprasegmental prosody).

In verbal language the display of emotions is strictly rule governed and implies total awareness, therefore it is communication in a strong sense.

On the other hand, another way exists to display emotions – one that is not so aware but tacit, or unconscious, and generally biologically governed: emotion expression.

#### 4.2. “Non-social” vs. “communicative” expression

I define as emotion expression the fact that A, when feeling an emotion, to give vent to it, produces an expressive signal that is a physical stimulus perceivable by other agents (a behaviour, like smoking avidly, or a morphological trait, like a pale face), that is produced as a side effect of physiological correlates of A’s emotion and, through the mechanism of signification, may give other agents the belief that A is feeling that emotion. For example, *A is anxious about her exam and walks up and down nervously*; or, *while meeting a boy she likes, she feels deeply moved, and her voice trembles*.

In this sense expression is meant in its etymological sense (*ex premere* = to press out), and viewed as a way of giving vent to something. A simply has the goal of lowering her level of arousal; her goal is not to have others know about her emotion, so much that we can even call this a kind of “non-social” expression. But nonetheless, the perceivable stimulus produced by A may be interpreted by B as a signal of A’s emotion.

Beside this “etymological” sense of expression, we have “communicative expression”.

It is a kind of communication that is different from “non-social” expression in that in it A does have the goal for B to know of her emotion; but it differs from communication in the strong sense because

- the goal of communicating is either an unconscious goal or a biological function
- A does not have the goal of making it known that she has the goal of making known
- A does not provide information about the event that caused the emotion, but only about the emotion itself
- the expression is produced necessarily at the same time the emotion is felt (Poggi, 1981) (otherwise, if the emotion is reported, it can only be communication).

#### 4.3. Communication in a weak sense

It may also exist, however, a case in between expression and communication in a strong sense: a case of “communication in a weak sense”. You have communication of an emotion in a weak sense when A feels an emotion and produces a communicative signal of it, because A has the goal for B to know that A is feeling it. The goal of communicating is not a biological goal but an internal goal of the individual; nonetheless, it is not necessarily a conscious goal – A *does not* have the goal for B to know that A has the goal to let B know of her emotion. For example *the teacher, when meeting her colleague, spontaneously smiles at her, not out of bare politeness, but because she wants to let her understand she is happy to see her*. Not being a hypocrite smile, it is not necessary for A to produce it with full awareness; and if the goal of smiling is not completely aware also the meta-goal (I want you to know that I want you to know), which is the condition for communication in the strong sense, is not present.

### 5. Inferring emotions

It is not necessary for A to express or communicate her emotion in order for B to know A is feeling it; B can also come to know this through inference. Suppose B knows from radio of a misfortune that occurred to A, who B does not know personally; even if B does not receive any expressive cue of A’s sorrow (for instance, A is not interviewed while crying), B can imagine how A feels. And he

can do this in two ways: either through a more detached route, reasoning, or through a more involving route, putting himself in A's shoes (Castelfranchi, 1988).

Through reasoning, B thinks of the event that occurred to A and, on the basis of a general rule, according to which such an event thwarts important goals of people, B infers that A is feeling sorrow. By putting himself in A's shoes, B imagines how he himself would feel, if such an event occurred to him. To do so, B imagines to be A, and in his own mind simulates those processes that could go through A's mind in that situation, and hence the emotion that B himself would feel if he were A. This simulation may be "ego-centred" if, while reproducing A's thoughts, B attributes her his own goals and beliefs; or "de-centred", if he simulates A while attributing her goals he in fact thinks could be A's goals.

As we shall see below, putting himself in someone else's shoes leads B not only to understand that A feels a certain emotion, but to feel it, such that we have a case of emotion induction that we call empathy.

## 6. My emotion, your emotion

When an emotion stemming from an emotion felt by A is induced in B, what is the relationship between A's emotion and B's emotion? The emotion induced in B, with respect to the emotion felt by A, may be:

- a. Similar - for example: *A communicates her happiness to her friend B and B feels happy too. Teacher A expresses her passion for her class topic and students come to feel interested in it.* In this case the structure of the relationship is:

A feels E about X  $\rightarrow$  B feels E about X:  
the subject feeling the emotion is different, but the Emotion is identical or similar, and the object is the same;

- b. Reciprocal: *A tells B she loves him and B starts to love her.* Here,

A feels E toward B  $\rightarrow$  B feels E toward A:  
the emotion is the same, but subject and object change places;

- c. Complementary: *A tells B she is very sad and B feels compassion for A; or else, A tells B she is very happy and B feels envy.* Here,

A feels E1 about X  $\rightarrow$  B feels E2 about X:  
the emotion is different, the subject changes, and the previous subject becomes the object.

## 7. Emotion transmission

I define transmission of emotions as the fact that an Agent B comes to feel an emotion identical or similar to one felt by another Agent A, and this is due to a process of induction of the emotion from A to B.

Typical cases of emotion transmission are contagion and empathy.

## 8. Emotional contagion

I define as contagion a case of emotion induction in which A's production of an expressive signal ES of an emotion E1 causes B too to feel an emotion E2 that is identical or similar to the emotion expressed by A.

About the temporal sequence of this device one can put forth different hypotheses, according to the theory of emotions one takes as most plausible. According to James-Lange peripheral theory, where peripheral sensations induce an emotional feeling (I am afraid because I am fleeing), the following sequence can occur (Hatfield, Cacioppo & Rapson, 1997):

- a. A feels an emotion E
- b. A produces a communicative emotional signal ES that expresses his emotion E
- c. B perceives signal ES
- d. B produces ES
- e. B feels an emotion that is the same as A's, or similar to it

B's perception of A's emotional signal causes B to re-produce this signal (c. causes d.), and B's production of the peripheral signal triggers the corresponding emotion (d. causes e.).

According to this hypothesis, Agent A feels an emotion and expresses it with an expressive signal; Agent B perceives the signal and he reproduces it, in an automatic way (that is, not necessarily with a high level of consciousness and intentionality). The very fact of reproducing A's emotional signal triggers the corresponding feeling in B.

a. A's emotion → b. A's signal → c. B's perception of A's signal → d. B's signal → e. B's emotion

Passage from b. to c. can be accounted for by the activity of *mirror neurons*, the neurons that fire both in perception and in production of body movements and give rise to imitation in some primates. Thanks to this device, A's signal may almost automatically cause the production of B's signal. But how can you pass from d. to e., that is from the signal produced to the corresponding emotion? Accounting for this passage calls to another very discussed issue in emotion theories: the hypothesis of facial feedback (Darwin, 1872; Hager & Ekman, 1983) according to which the direction of causality between emotional internal experience and external expression could be close to that of peripheral theories – it is not only the feeling that determines expression, but expression itself may determine the feeling. Among the implications of this hypothesis is the fact that the whole process is not necessarily subject to deliberate and conscious control, both for A and B: A may be conscious or not that she is producing emotional signals, and may deliberately choose to produce, or to not produce some. Obviously in some cases contagion, on the part of A, is deliberate and conscious, for example in *the politician who harangues the crowd by expressing his emotions and transmitting them to people*.

Emotional contagion may hold for negative emotions like anxiety (many of us may have experienced being affected by a schoolmate's anxiety while waiting to take an exam), but also for positive emotions like mirth (a passer-by who walks whistling may put one in good mood); and typically yawning and laughter are contagious. A positive emotion typically subject to contagion is enthusiasm that, when passed on to others, causes an effect of amplification, by triggering more and more enthusiasm in other people: as soon as A transmits her enthusiasm to B, both A and B feel enthusiasm, both express it, both reciprocally perceive each other's enthusiasm, and the intensity of the emotion is raised in both (Poggi, 2007 b).

## 9. Induction as an effect, induction as a goal

As we mentioned, when A lets B know that A is feeling an emotion, this may cause, either as an effect or as a deliberate goal, the induction of an emotion in B. To see the differences between these cases, let us analyse some examples.

### 9.1. Contagion as an effect

*A is anxious for her examination and is nervously walking up and down outside the classroom.*

*After a while, B feels nervous too.* Here A is feeling and expressing an emotion: she does not have the goal of influencing B or of having B feel emotions, and B is not even mentioned in A's goals; she simply has the goal of lowering her own emotional tension, her arousal, and for this reason she produces an expressive signal; but in doing so, she induces a similar emotion in B. In this case not only is it that A cannot even be aware that she is producing a signal of anxiety; but B may not be aware that he is perceiving that signal. He suddenly starts feeling nervous, without even knowing why. This is a case of non-deliberate and automatic induction of emotion: a case of emotional contagion.

I define as "emotional contagion as an effect" the case in which the induction of an emotion in B is an effect of an emotional expression produced by A: that is, the fact that the expression of an emotion by A has the effect (not deliberately planned by A) that B feels the same or a similar emotion – one, for example, of the same family and only less intense.

However, this induction of an emotion through contagion, which in the example above can be completely unaware and non deliberate, can also be wanted by A: in some cases, A deliberately acts with the goal of transmitting her own emotion to B. This gives rise to another case.

### 9.2. Contagion as a goal

A feels an emotion, and she has the goal of having B feel it too. In order to this, she produces a communicative signal. For example, *a politician expresses his indignation very strongly in order to have constituents feel indignation too.* Here A feels an emotion, and believes that if B knows she feels it he is likely to feel it too, and wants B to feel it; so A produces a communicative signal of that emotion. In this case contagion is obtained not through a bare expression, but through an act of communication in a strong sense, in which the politician not only wants the constituents to know of her indignation, but also wants them to know that she has the goal of letting them know of her indignation. The only problem here, as we shall see in Section 11, is that the more B believes A deliberately wants to pass him her emotions, the less effective contagion is, since in this case B may think that A is specifically concerned with inducing that emotion.

## 10. Empathy

Empathy holds when an emotion E is induced in an Agent B, and this induction is caused by a belief of B that some other Agent A is feeling the same or a similar emotion. The belief that A is feeling emotion E may be caused either by the fact that A actually expressed or communicated it, or simply by the fact that B has inferred this emotion of A, by reasoning or by putting himself in A's shoes.

If A explicitly expressed, or communicated her emotion (whether consciously and deliberately or not), and if he she really feels it, we can, insofar as contagion is concerned, call this a case of emotion transmission. But if no explicit communication or expression has occurred, and the belief about A's emotion is only inferred by B, it may happen that only B comes to feel that emotion; and in this case this is not emotion "transmission".

In fact, empathy can also occur, so to speak, only on the part of B. For B to feel empathic to A, in fact, it is not necessary for A to really feel an emotion. It may be that A is a very cold person, one not very keen to emotion, while B is a warm person, who simply by imagining one is in some situation tends to feel the corresponding emotion himself. So empathy can even be defined as the fact that B feels an emotion just because he believes that A feels one, or could / should feel one.

What are the routes to empathy? That is, how does B come to the belief about A's emotion? In some cases, this belief is explicitly expressed or communicated by an emotional signal produced by A: the same start as for contagion. So empathic people may, in some cases, be the ones who are keener to emotional contagion. But empathy is a way of emotion transmission that is both ontogenetically and phylogenetically more evolved than contagion (Bonino, Lo Coco & Tani, 1998), just because it is not strictly dependent on the other's emotional expression. In empathy, the other's emotion can also be inferred: a belief about A's emotion is autonomously generated by B either through a quite "cold" and detached route (reasoning) or through a more involving one (putting oneself in the other's shoes). So, when empathy is allowed by contagion, that is by A's expression, B's emotion is directly triggered by it: so to speak, feeling precedes knowing. But if no expression and no contagion are present, B can be empathic to A simply because he understood how A may have felt. In fact, empathy requires a higher cognitive development than contagion, because it implies a capacity for role-taking and at the same time requires and allows for a higher detachment from the other's emotion. This is what, for example, allows a social worker or a psychotherapist not to be overwhelmed by her client's sorrow, and to be stronger in helping him. But here we want to focus on other differences between contagion and empathy.

- a. Empathy, different from contagion, is self-generated by B

Not only is it not necessary for B to perceive A's expression or communication, since he can infer A's emotion, but, even more, B may come to feel the emotion he attributes to A even if A actually does not feel it.

- b. Empathy differs from contagion in the direction of action: in empathy there is an "active" attitude of B as opposed to a "passive" attitude in contagion

While contagion goes from A to B, and B is in a sense a passive receiver of the emotion flow first coming from A, in empathy it is B who, so to speak, "goes to take the burden" of A's emotion. It is A who infects B, but it is B who is empathic to A. And even when B's empathy is first triggered by contagion, B's being empathic implies that B is actively accepting this contagion and taking the emotion on himself.

- c. In contagion feeling the emotion is functional to B's goals, while in empathy it is functional to A's goals.

An emotion is an adaptive device that monitors the state of achievement or thwarting of the important adaptive goal of an Agent. The emotion felt, and the actions eventually triggered by it, are generally functional to bring about the conditions to achieve the goals of the Agent put at risk by the situation. So, fear monitors the goal of survival and physical well-being, and triggers the action of flight or fight; shame monitors the goal of image and self-image, and triggers the action of avoiding exposure or of apologising.

In contagion the emotion felt, as well as the action triggered in B, are functional to the goals of B, while in empathy the emotion and the action are functional to the goals of A. If contagion of panic holds, I escape to save myself, you escape to save yourself. But in empathy, if I am sad for you I



may tend to help you: so my emotion is for you, not for me. This is why empathy is linked to altruism (Batson, Ahmad, Lishner & Tsang, 2002). In contagion emotion is useful to one's goals; in empathy it is useful to the other's goals.

### **11. From the goal of induction to deception**

As we have seen, in many cases inducing emotion in others is not simply an effect but a goal. Very often we want to cause others to feel some emotions. One of the most frequent reasons for this is that emotions, having a very strong motivating power, induce action. So when we want to influence other people, that is, to generate or activate some goals in them, if these goals are more easily or more typically triggered by emotions, we must induce emotions in them. All social influence, and mainly a particular form of social influence, persuasion, very often passes through the induction of emotions. But when emotion induction is deliberately wanted and aimed at persuasion, since inducing emotions in others depends on our manifestation of emotions, in some cases we could be concerned with manifesting even emotions that we do not feel, or else in not letting others understand how much we are concerned with making them know our emotions. This is because we feel that the more the other believes this emotion "comes out of our heart", that is, the more spontaneous and the less deliberate our expression looks, the more the other is "convinced" or "conquered" by our emotion. To induce emotion in a more efficient way, in fact, A, strangely enough, must show that she does not want to communicate her emotions. This gives rise to some deceptive uses of the expressive and communicative signals of emotions.

### **12. Induction, deception and social influence**

According to Castelfranchi & Poggi (1998), deception is any action (or even non-action) of an Agent A aimed at preventing another Agent B from having a true belief (defined as a belief that A believes true). We can deceive not only through lies, that are informative speech acts, but with any kind of communicative act – gestures, smile, facial expressions – as well as objects, actions, and even omissions. The function of deception, just like the function of all communication, is to influence other people: since people do things on the basis of their beliefs, to give them the beliefs we want (whether true or false) is a way to make them do what we want. In the same vein, since often people are motivated to do things by their emotions, to induce emotions in them, be they really felt or not by ourselves, is another way to make them do what we want.

There are two main ways to deceive: *deprivation* – not to give true beliefs – and *deviation* – to give false beliefs. Moreover, depending on what one has to do to bring about deprivation or deviation, we can distinguish four types of deception:

- a. omission: in order for B not to assume the true belief TK, A simply does not do anything; for example *A does not tell B about a competition B might be interested in;*
- b. concealment: in order for B not to assume the true belief TK, A does some non communicative action: for example *A, hearing her husband B unexpectedly come home, hides her lover in the wardrobe, not to let him know he is in her room;*
- c. falsification: in order for B to assume the false belief FK, A performs some communicative (verbal or non verbal) action that conveys belief FK: *to boast with friends, the fisherman tells he fished a huge fish;*
- d. masking: in order for B not to assume the true belief TK, A conveys a false belief FK; masking is to perform concealment through falsification. For example, *not to let B take part in the competition, A tells him a false date.*

People can deceive on any kind of topic: not only about knowledge of the world, but also about their own mind. And often, they are deceptive about their emotions. Sometimes they deceive simply

because they do not want others to really know what they feel – due to reservation or to be less vulnerable; but sometimes they can deceive about their emotions in order to induce particular emotions in others. Let us see some cases of deception about emotions aimed at induction.

### **12.1. Emotion omission**

A feels an emotion E, but has the goal of not letting B know she feels it, and in order to this inhibits her expressive signals of emotion E. It is the case of the “poker face” (Ekman, 1985): to show impassibly, to pretend nothing happened. Another case of deception is deprivation, in particular, a case of omission. *Teacher A meets her colleague who she hates, but does not let her hostility leak out.* Also, these cases may have a goal of induction, and possibly a further goal of influencing the other. For example, *I may conceal my fear in order to let you feel disappointed that you did not manage to intimidate me.*

### **12.2. Emotion concealment**

A feels an emotion, but does not want B to know it, so she hides her emotional expression. For example, *A turns her head aside because she does not want B to see her cry.* This may be aimed at preventing the induction of an emotion of pity, or, on the contrary, to induce an emotion of admiration and possibly an attitude of B to interact with A on a peer level.

### **12.3. Emotion falsification (or: deceptive communication of an inexistent emotion)**

A does not feel an emotion E, but has the goal of letting B know she feels E, and in order to do this she produces a communicative signal of that emotion. This is one of the typical cases determined by Ekman’s (1982) *display rules*; in terms of Castelfranchi & Poggi (1998), a case of deception by deviation, in particular a case of falsification: to give the other a belief you do not believe is true. For example, *A shows to be very sad at the funeral of a simple acquaintance.* Or else, *Teacher A meets colleague B; she is not very happy to meet him, but smiles at him.* This could be called a case of “Hypocrisy by addition”: A “invents” the emotion “I am happy to see you” and communicates it deliberately.

### **12.4. Emotion masking (or: deceptive communication of a different emotion)**

A feels emotion E1, but she has the goal to have B believe that she feels emotion E2, and in order to this she produces the expressive signal of E2. This is another application of Ekman’s display rules: to mask an emotion by communicating another emotion. Another case of deception by deviation, in particular a case of masking: communicating, instead of a true belief, another belief, generally false, that “hides” the true one. *The teacher hates her colleague, but when she meets her she smiles at her.* We can call it “hypocrisy by masking”. Or again, *mother feels tenderness and fun for her little child’s prank, but she pretends to be angry to scare him and thus to teach him he should not do it anymore.*

### **12.5. Feigned expression of emotion**

In the cases seen thus far A deceives about the content of her expression, that is, the object of A’s deception are the emotions themselves; an emotion is omitted, another emotion is simulated, another one is concealed by non-communicative action or by the expression of a different emotion. In other cases, however, deception does not concern the content of the emotional expression – the emotion per se – but the communicative status of the expression itself – whether spontaneous expression or deliberate communication. Take this example: A feels an emotion; she wants B to know it, but she does not want B to know that A wants to let B know it; therefore A pretends her expression to be spontaneous, non deliberate, and pretends she does not take B into account; but she also tries to be certain that B is perceiving her expression. For example, *in order to make B feel*

*guilty, A cries silently, pretending she does not know B is seeing her.* In this case A deliberately produces an expressive signal in order to let B know of her emotion, and she acts in order to make B perceive the signal, but she does not want B to know that she wants to let him know of her emotion, nor does she want him to understand that she wants him to perceive the signal.

This is a case of deceptive expression not because A deceives about the content of the emotion (it is true that A feels an emotion, and the emotion she expresses is just the one she does feel), but because she deceives about her goal of expressing it: in fact she does not express it, but she “communicates” it in a weak sense.

As mentioned above, we distinguished a case in between bare expression and communication in a strong sense: “communication in a weak sense”. We introduced this case just because sometimes A wants B to know that A is feeling an emotion, but she also specifically wants B not to know that it is just A who wants him to know this.

But what is the difference between spontaneous expression and deliberate expression?

Expression is a manifestation of mental states of an Agent that can even be triggered by a conscious goal to display them, but is more often governed by goals that are not under conscious control. Further, beside not being aware of our goal of communicating an emotion, sometimes we do not even realize that we are producing some signal of it: a bitter expression can leak from my face even if I have no intention to make my thought public; and I may come to know of my expression only when someone asks me “what’s the matter with you?”.

This is why non deliberate expression is felt as more genuine, just because it is not under conscious control, and thus it cannot be subject to deception.

### **13. Transmission of emotions**

We defined as emotion transmission the process through which the expression of a felt emotion by an Agent A actually induces the same or a similar emotion toward the same object in an Agent B. In fact, many of the cases above cannot be considered as transmission of emotion. First, all cases in which the emotion induced in B is in a reciprocal or complementary relation to the emotion expressed by A are ruled out. If *I tell you I esteem you to induce your esteem of me*, this is not emotion transmission, because even if the emotion is the same, the object is not; nor is it a case of emotion transmission if *I show sadness to induce your compassion*.

Furthermore, all the deceptive cases listed above cannot be defined as emotion transmission. This is clear, of course, for emotion omission (Section 12.1.) in which no emotion is expressed, even if it is felt: a necessary condition for transmission to occur is not only existence, but also expression of the emotion. Also, for emotion concealment, falsification and masking (Sections 12.2., 12.3., 12.4.), you cannot speak of transmission both if the emotion E2 induced in B is caused by the expression of emotion E2 of A but A actually feels emotion E1, and if A does not feel any emotion at all. Typical cases of emotion transmission are instead, generally, contagion and empathy. Contagion – the induction of the same or a similar emotion – is transmission both when spontaneous and when deliberate. Also deliberate contagion will count as transmission when the emotion induced, even deliberately and consciously (for instance, the politician’s indignation), is really felt by the one who expresses it. As for empathy, instead, it can be considered a case of transmission only when the emotion that B empathizes with is actually felt by A, and not if, so to speak, B “over-empathizes”, in that he imagines – and feels – emotions that A in fact does not feel.

Finally, as we already mentioned, we also could not talk about transmission if A does feel the emotion, but does not express it or communicate it in any way. In this case, again, it is only thanks to B's inference (not thanks to a real transmission), that the emotion felt by B is just the same as the one felt by A.

#### **14. Conclusion**

The attempt of this paper has been to define the various ways in which emotions can pass from mind to mind – and from body to body – and the function of this osmosis of emotions.

An emotion is something that dwells in a specific person, and cannot be felt exactly in the same way by another person: it is me and only me in front of my emotion. Yet, an irresistible tendency holds for our emotions to pass through from one person to another. The other is important for my emotions: some of them are toward the other (in “social” emotions like love and hate, pity and tenderness, contempt and admiration), and thus for him to know what I feel toward him is important information for our present and future interaction. But in other cases, even for “solitary” emotions, the other can help me to bear them more easily, to understand them better, or he/she can share them with me. Thus emotions very often pass from mind to mind. But since their passing through can generate more emotions and new relations, and trigger action, it is important to understand and distinguish in how many ways this transfer occurs, whether through deceptive or truthful expression or communication, or through putting ourselves in the other's mind.

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## References

- Bonino, F., Lo Coco, A., & Tani, F. (1998). *Empatia. I processi di condivisione delle emozioni*. Firenze: Giunti.
- Carr, L., Iacoboni, M., Dubeau, M. C., Mazziotta, J. C., & Lenzi, G. L. (2003). Neural mechanisms of empathy in humans: a relay from neural systems for imitation to limbic areas. *Proceedings of the National Academy of Sciences*, 100(9), 5497-5502.
- Castelfranchi, C. (1981). Scopi esterni. *Rassegna Italiana di Sociologia*, XXII, 1, 329-381.
- Castelfranchi, C. (1988). *Che figura. Emozioni e immagine sociale*. Bologna: Il Mulino.
- Castelfranchi, C. (2000). Affective appraisal versus cognitive evaluation in social emotions and interactions. In A. Paiva (Ed.), *Affective Interactions* (pp. 76-106). Springer: Berlin.
- Castelfranchi, C., & Parisi, D. (1980). *Linguaggio, conoscenze e scopi*. Bologna: Il Mulino.
- Castelfranchi, C., & Poggi I. (1998). *Bugie, finzioni, sotterfugi. Per una scienza dell'inganno*. Carocci, Roma.
- Conte, R., & Castelfranchi, C. (1995). *Cognitive and social action*. London: University College.
- Darwin, C. (1872). *The Expression of the Emotions in Man and Animals*. New York and London: Appleton and Company.
- Ekman, P. (1982). *Emotion in the Human Face*. Cambridge: Cambridge University Press.
- Ekman, P. (1985). *Telling lies*. New York: Norton.
- Ekman P., & Friesen W.V. (1978). *Facial Action Coding System*. Palo Alto, CA: Consulting Psychologists Press.
- Frijda, N.H. (1986). *The emotions*. Cambridge and New York: Cambridge University Press.
- Hager, J.C., & Ekman, P. (1983). The inner and outer meanings of facial expression. In J. T. Cacioppo & R. E. Petty (Eds.), *Social Psychophysiology: A Sourcebook* (pp.287-306). New York: The Guilford Press.
- Hatfield, E., Cacioppo, H.T., & Rapson, R.L. (1994). *Emotional contagion*. New York: Cambridge University Press
- Iacoboni, M., Woods, R.P., Brass, M., Bekkering, H., Mazziotta, J.C., & Rizzolatti, G. (1999). Cortical mechanisms of human imitation. *Science*, 286(5449), 2526-8.

- Miller, M., Galanter, E., & Pribram, K.H. (1960). *Plans and the structure of behavior*. New York: Holt, Rinehart and Winston.
- Poggi, I. (1981). *Le interiezioni. Uso del linguaggio e analisi della mente* Torino: Boringhieri.
- Poggi, I. (2005). The goals of persuasion. *Pragmatics and Cognition*, 13:2, 297-336.
- Poggi, I. (2006). *Le parole del corpo. Introduzione alla comunicazione multimodale*. Roma: Carocci.
- Poggi, I. (2007 a). *Mind, hands, face and body. A goal and belief view of multimodal communication*. Berlin: Weidler.
- Poggi, I. (Ed.) (2007 b). *La mente, gli altri, le emozioni*. Roma: Armando.
- Poggi, I., & Magno Caldognetto, E. (1997). *Mani che parlano. Gesti e psicologia della comunicazione*. Padova: Unipress.
- Poggi, I., & Magno Caldognetto, E. (2004). Il parlato emotivo. Aspetti cognitivi, linguistici e fonetici. In F.Albano Leoni, F.Cutugno, M.Pettorino & R.Savy (Eds.), *Atti del Convegno nazionali Il parlato italiano*. Napoli, 13-15 febbraio 2003. CDRom. Napoli: D'Auria Editore.
- Rizzolatti, G., Fadiga, L., Fogassi, L., & Gallese, V. (1997). The space around us. *Science*, 277, 190-191.