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ALEXANDRA DIMA\*

## THE INTERPRETATION OF FACIAL BEHAVIOUR IN COMMUNICATION: FROM UNIVERSAL CODES TO INTERSUBJECTIVE SITUATED MEANING<sup>1</sup>

The overarching theme of shared cognition in communication characterizes many of the current research efforts in various theoretical and applied areas of psychology, neuroscience, and linguistics. One of the areas currently being transformed by this multidisciplinary trend is the study of facial behaviour. This paper discusses the recent shift from traditional views of facial expression towards a more sophisticated perspective. Previous attempts to identify one-to-one relations between facial displays and emotional meanings suffer from a simplistic understanding of intersubjective processes. Emerging evidence suggests a new account of facial behaviour as a phenomenon influenced by multiple factors and with a complex role in human communication.

*Keywords:* intersubjectivity, facial expression, interaction, facial displays.

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## 1. Introduction

The obvious and puzzling ease with which humans succeed to develop shared knowledge to a high degree of complexity in face-to-face communication is considered to be partially due to the synergistic use of multiple modalities, among which *facial behaviour* (FB) plays a central role. The progress made in the last decades in the study of human interaction has changed enormously our understanding of FB, by which I refer to movement of facial muscles, also known as *facial expression*, *facial displays* or *facial actions*. From an initial view limited to defining sets of distinct movements corresponding to specific emotional states, the field is moving towards an account that emphasizes the collaborative and dynamic interpretation of FB within the broader context of the interaction. The present article, in which I attempt to expose this change, is intended both as an illustration of the complexity of human communication and as an effort to synthesise the numerous strands of research findings into a coherent structure aligned to these recent advances. I will start by describing its traditional interpretation, then review evidence from different domains and attempt to sketch an emerging picture of FB. I will finish by describing the theoretical and methodological implications of this new perspective for further research.

## 2. A Simple Model of FB

In the past, FB has been studied mostly in relation to emotion and it is now considered common knowledge that there is a list of universal human emotions with corresponding distinctive facial expressions. But, as with all simplifying statements, closer scrutiny reveals an enduring controversy. Many authors have highlighted the need to go beyond this universality claim and consider the complex causation of FB (Russell & Fernández-Dols 1997), as well as its multiple roles in communication and social interaction, beyond the expression of emotion (Bavelas & Chovil 2000; Fridlund 1994).

Let us first look closer at our starting point and consider its merits and limitations. The statement that facial displays have universal meanings closely related to emotion is related to the work of three scientists,

Silvan Tomkins, Paul Ekman and Carroll Izard, who did not focus on explaining the phenomenon as such. Inspired by Darwin's account on the expression of emotions (Darwin 1872/1965, as cited in Russell & Fernández-Dols 1997), they used data about FB to develop their related theories of emotion. Tomkins' *affect theory* (Tomkins 1982) was developed as a reaction to the limitations of the drive theory and stipulated the existence of additional basic affects which are innate and universal, have an amplification function and hold a central place in motivation due to their generality. The difference between affects is given by the density of neural stimulation which determines their unique FB signatures and functions.

Ekman's *neuro-cultural model*, although presented as a model of FB (Ekman 1972, as cited in Ekman 1994), actually refers just to a limited subset of expressions related to a list of primary affective states (Ekman & Friesen 1969, as cited in Ekman 1994). It is basically a statement related to the universality claim and specifies two types of determinants of this specific subset: pan-cultural factors (possibly due to evolution, innate neural programs or common learning experiences) influence the types of facial muscles involved, while cultural differences manifest in the eliciting circumstances, consequences and display rules of specific affects (Ekman & Friesen 1971). Later, Ekman intentionally separated his research on FB from his study of emotion (Ekman, Friesen & Hager 2002a), with the former resulting in the most detailed (and atheoretical) coding system of FB to date (*FACS*; Ekman, Friesen & Hager 2002b) and the latter focusing on testing his basic emotions theory (Ekman 1992).

Izard's *Differential Emotions Theory* considers emotions as one subsystem of personality, having a central role in motivation. Basic emotions are viewed as distinct systems with separate, modifiable and dissociable components, one of which is FB (more exactly, some emotion-specific facial configurations). His research focuses mainly on issues concerning the ontogenetic development of these systems (Izard 1997).

A detailed analysis of these theories is beyond the scope of this paper. Suffice it to say that none of these authors has set out to describe and explain FB in itself. Similarly, Darwin's account of facial expression is far from being a theory of FB, as it was mainly intended to support his views on evolution in opposition to creationist views of his time and has been subsequently taken out of context (Fridlund 1994; Russell & Fernández-

Dols 1997). Therefore, their examples of one-to-one correspondences between some FBs and emotion and the associated explanations cannot be considered a comprehensive account of FB and its role in spontaneous communication. The limits of this initial view come from two main sources: a limited consideration of other determinants of FB and its reliance on a model of communication which does not take into account the complexity of human interaction in naturalistic settings.

The first is a matter of choice and different research interests: the rest of the factors that influence FB are apparently meant to stay out of focus while emotion is center stage. For example, Ekman's remark about the use of facial actions as conversation signals (Ekman et al. 2002a) is never developed. His research never explores the influence of other factors on FB, as he considered them as sources of noise for his attempts to measure the innate emotion programs, and against which he devised an experimental design that was later criticized (Ekman 1994; Russell 1994). His statements on the control of FB are mainly focused on deception in emotional situations and therefore limited (Ekman & O'Sullivan 2006).

However this does not imply that the existence of other factors is not acknowledged. It is often neglected that these three authors do not assume an absolute equivalence between emotions and their correspondent facial expressions. For example, Izard states that FB is not a necessary component of emotion and specifically opposes the idea of a single prototypical expression for each emotion (Izard 1997). Ekman stipulates mechanisms of controlling of FB (intensifying, deintensifying, neutralizing, masking) which are governed by display rules learned in early life and are applied depending on transient features of the context and participants (Ekman & Friesen 1969, 1975, as cited in Ekman, Friesen & Ellsworth 1982).

The second source of limitations is more subtle and problematic. The initial view on FB is tributary to the classical model of communication as information transmission, also known as the *code model of communication* (Shannon & Weaver 1949, as cited in Sperber & Wilson 1995). It describes communication as a one-way transfer of messages through a channel using signals. The correct transfer is due to both encoder and decoder possessing an identical code that transforms the messages into signals and back while errors are due to noise distorting the signal across the channel. Thus, FB was conceptualized as a nonverbal/body language

for which, it was hoped, the secret code will be cracked and the hidden meaning revealed (Ekman 2004). The one-to-one relationship between a certain facial configuration and an emotional meaning was considered equivalent with a similar relationship between a particular word and its dictionary meaning. These assumed relationships were indeed collected in a dictionary-like format (Rosenberg 1998). As the model was focusing on the message rather than the participants in the interaction and their different roles, essential distinctions between the expresser (encoder, sender) and the viewer (decoder, receiver) were not considered, and neither were the mechanisms by which the participants reach a common understanding of the situation (or not).

Later research on human interaction changed the focus from emotion to the multiple causation of FB and exposed the limits of applicability of the code model in the domain of spontaneous interaction. To anticipate the next sections, it not only failed to find such a code for FB, but uncovered the complexity of communication at both linguistic and non-linguistic levels, exposed the weaknesses of the code model and advanced new models more adequate for the study of communication as a dynamic and collaborative phenomenon.

In brief, these theories were limited by design and not intended to support inferences related to spontaneous interpersonal communication. Despite their differences and limits, these theories were pooled together in a single model based on their strong similarities and considered a theory of FB (Russell & Fernández-Dols 1997). The link between FB and emotion was taken as a scientific fact, and inferences were made based on it (Russell 1994). Certain facial configurations became expressions of corresponding basic emotions irrespective of the context, as if they were a matching code for an immovable meaning. The lack of concordance between the meaning of the facial configuration and the self-reported or context-derived meaning was justified by nonspecific terms such as masking, deception, and display rules. This became the most controversial aspect of this model. The conclusions were criticized as having no ecological validity, the methodology as flawed and based on unjustified assumptions (Russell 1994). Although a full description of this debate is not the focus of this article, it is important to state that the debate was extremely fruitful for the study of FB. It established FB as a phenom-

enon deserving scientific investigation on its own and determined a proliferation of research that brought to light the influence of other factors. The resulting evidence loosened the link between FB and emotion and thus diminished the weight that the inferences based on this link had for the initial emotion theories. It became evident that existing data on FB can support alternative theories, some related to emotion (Frijda & Tcherkassof 1997; Russell 2003; Scherer & Ellgring 2007), some giving a non-emotional interpretation (Bavelas & Chovil 2000; Fridlund 1994), each having different implications for the study of communication. Most important, this evidence helped build a new understanding of FB as participating in an interactive, dynamic and flexible process of meaning construction congruent with the current research on intersubjectivity. This new understanding is the focus of the next sections.

### 3. A Complex Model of FB – Emerging Features

What affects the variation of FB and its associated meaning? As the research and theory in this area progressed, it became evident that the production of and the reaction to FB are two separate phenomena which, although they shape each other, can be influenced by different factors, and need to be studied separately (Russell, Bachorowski & Fernández-Dols 2003).

#### 3.1. *The Expresser*

Research on the coherence of emotional experience indicates that FB and self-reported emotional experience have medium to high correlations under specific conditions pertaining to the emotion type and intensity and the study design (measurement, timing, sources of variation) (Mauss et al. 2005; Rosenberg & Ekman 1994). This connection is strengthened by studies of the impact of changes in FB on emotion self-report, also known as the *Facial Feedback Hypothesis*: voluntary production of specific combinations of facial movements under controlled conditions tends to elicit self-reported experience associated with the corresponding emotions (Izard 1990; Levenson, Ekman & Friesen 1990; Levenson et al. 1992). This body of research suggests that one factor that influences FB

is the encoder's emotional experience. However, other studies have highlighted a considerable non-overlap between the two, for example in relation to intense negative emotion induced by exposure to emotional video sequences (Fernández-Dols et al. 1997), or surprise elicited via various experimental paradigms (Reisenzein 2000; Reisenzein et al. 2006). The connection emotion – FB remains a controversial issue. It is not a question of whether such a relationship exists, but of what mechanisms explain the encoding, to what extent they are subject to conscious control and what part does emotion play in the multitude of influences that FB is subject to in the dynamics of spontaneous interaction. These three issues have received a lot of attention recent years.

First, how is the emotional experience encoded in FB? One account is provided by the *discrete emotions theories*: antecedent events trigger an adaptive reaction managed by innate emotion programs which put the whole organism into a particular mode and thus produce a coherent response characterized by various changes, especially in FB (Tomkins 1962, as cited in Scherer & Ellgring 2007). This model is consistent with the basic emotions view which states a direct correspondence between specific emotions and their prototypical facial expressions and variants. Another account is represented by the *core affect model of emotion*: antecedent events generate a change in a neurophysiological state characterised by valence and arousal (core affect). This change is attributed to the antecedents, which are further processed, and action is taken accordingly. FB (and other expressive changes) is reflecting either the core affect or the action and there is no equivalence between specific facial configurations and specific emotional reactions (Russell 2003).

A third account is represented by *componential models*: emotion is a sequence of interrelated and more or less synchronized changes in several components (cognition, physiological support, action tendencies, motor expression, subjective feeling), with emotion emerging from the interaction between these components. One componential model (Scherer & Ellgring 2007) states that the different response patterns, including FB configurations, are resulting from sequential appraisal checks based on effects of physiological change, preparation for action and sociocommunicative signals; it stipulates direct links between FB elements and appraisals. Another componential model (Frijda & Tcherkassof 1997)

defines the emerging emotions as states of action readiness, which directly command various actions, including facial expressions, viewed as either relational activities, social signals, activation manifestations or inhibitions. However, FB is also determined by physical context, prevailing activation mode, social influence, expected effectiveness, and has only a “loose and variable relation” (Frijda & Tcherkassof 1997: 96) with emotion.

A fourth approach to explaining the emotion-FB link is the *developmental-interactionist theory* (Buck 1994, 1999): primary motivational-emotional systems (primes) have three types of readout – arousal, expression and experience. These readouts are functionally independent, have evolved under different selection pressures and have a different ontogenetic development. While the function of the subjective experience is self-regulation, expressive behaviour (including FB) serves and adjusts to emotional communication and social coordination. The strength and direction of their relation depends on past and current social factors in the history of the individual.

Without attempting a detailed comparison of these theories, it is important to state that, despite their different predictions related to specific emotion states and facial configurations, all describe elicitation of emotion in terms of flexible, adaptive responses to a predominantly social environment. Thus, even in essentially emotional situations, the dynamics of social interaction is considered central to the mechanisms of encoding FB.

A second question concerns the extent to which the encoding process is conscious. In the initial model, the distinction between voluntary (conscious) and involuntary (unconscious) FB was formulated in terms of controlling emotional expression. It stipulated that involuntary FB is generated by the emotion programs and therefore it is a true measure of felt emotion, while voluntary FB is determined by control mechanisms intervening and, therefore, it is an indicator of false, unfeared emotion. It further proposed that involuntary displays of short duration and intensity will flicker on the face (or “leak”) despite efforts to control emotion. This assumption was used in further studies on deception, especially in relation to smiling (e.g. Ekman, Friesen & O’Sullivan 1988; Frank, Ekman & Friesen 1993). Clearly, this approach has several limitations: for example, (1) the attempt to differentiate between false and true displays based on their features and overlooking their other possible functions and context,

(2) an insufficient clarification of the criteria for deliberate control, and (3) the use of “lying” and “deception” to describe controlled expressions in general (for example in Ekman & Friesen 1982). These limitations, together with other theoretical considerations, lead some authors to completely reject the possibility of facial displays being influenced by, and therefore expressing emotion, and to consider them only as signalling intention (the *Behavioural Ecology View*, Fridlund 1994). Others have actively avoided the problem of consciousness and analysed FB only from the point of view of its role in communication (the *Social Communicative Approach*, Chovil 1997).

Buck's developmental-interactionist theory gives a more nuanced interpretation of the consciousness issue (Buck 1994). It stipulates three types of expressive behaviour (and thus of FB): spontaneous (part of a nonintentional, phylogenetically determined communication system), symbolic (part of an intentional, ontogenetically determined communication system) and voluntary initiated. In Buck's view, it is not a question of innate or learned. The present stream of expressive behaviour is a result of a permanent interaction between the two communication systems, both during the individual's life history (a phenomenon called emotional education, the result of which is emotional competence) as well as during the present exchange. Emotional education is about learning how to use the innate capabilities through the experience of human interaction. Buck makes an important distinction between inhibition (which involves temperamental factors and/or nonvolitional conditioned emotional responses) and control (involving symbolic display rules which can enhance, neutralize, suppress, mask or qualify a spontaneous display). Voluntary initiated displays are used to control expression and contribute to emotional competence. In this view, deception is only a special case of voluntary control.

Recent conceptualisations place deception at the far end of a continuum between truth and lie, and acknowledge the existence of multiple intermediary points (more or less benign) such as denial, positive illusions, white lies, malingering, etc. (Ekman & O'Sullivan 2006). Other authors have analysed FB in the context of emotional display management as a form self-presentation related to both emotion regulation and coping (Saarni & Weber 1999). It is increasingly accepted that a diagnosis

of the level of conscious control of emotional expression (and of the encoder's intentions) needs to take into account not only FB, but also the encoder's expression through other modalities (verbal, vocal, gestural, etc.), the present context and also prior information about the encoder. Thus, it becomes rather a global diagnosis of the interaction as a process of negotiating meaning towards reaching mutual and/or personal goals.

A third issue concerns the limits of the influence of emotional experience on FB as well as the nature of other contributing factors. Individual differences between encoders have proven important: gender (Kohler et al. 2004; Soto, Levenson & Ebling 2005), mental health status (Ellgring 1989; Merten 1997; Trémeau et al. 2005), and age – as a reflection of both the development of facial expressivity in childhood (Bennett, Bendersky & Lewis 2005) and of increased regulatory skills with age (Magai et al. 2006). Culture was shown to influence the difference in the physical instantiation of emotion related expressions (Elfenbein et al. 2007; Marsh, Elfenbein & Ambady 2003) and the impact of display rules on emotional expression (Matsumoto 1990). FB has been shown to be sensitive to changes in cognitive effort (Cacioppo, Petty & Morris 1985), the type of social interaction (Fernández-Dols & Ruiz-Belda 1995), degree of sociality, both real (Chovil 1991) and imaginary (Fridlund et al. 1990), and the expresser's communication intentions (Bavelas & Chovil 1997). Although the majority of these factors have been studied in relation to emotion, some of them are not connected to emotional experience. The mechanisms of encoding non-emotional FB have not yet been studied, but good descriptive accounts are available (Bavelas & Chovil 1997). These examples, not intended as an exhaustive list, highlight the multiple determination of the variability and meaning of FB, even when considering only one of the participants in interaction.

### *3.2. The Viewer*

By far the most studied is the impact of FB on the viewer, usually using variants of so called “judgement studies” which ask participants to judge what emotions characterize certain facial displays. Their prevalence is due mainly to the fact that the methodology is by far the easiest to apply as opposed, for example, to studying spontaneous interaction, but also

because it has provided a good basis for exploring the role of various factors on decoding FB. In addition to the well documented tendency of viewers to reach a high consensus regarding the emotional states of a person based on his/her facial displays (Elfenbein & Ambady 2002), many other factors have been shown to influence the attributed meaning of FB. Belonging to the same cultural group increases consensus due to ethnic bias (Kilbride & Yarczower 1983), stereotypes (Kirouac & Hess 1999), and cultural exposure (Elfenbein & Ambady 2003). Consensus also varies with majority or minority status within a culture (see Elfenbein & Ambady 2002 for a review) and language (Mesquita & Frijda 1992). Intercultural differences are manifested in decoding rules (Matsumoto & Ekman 1989). The attributed meaning is influenced by the viewer's gender and level of education (Kirouac & Dore 1985), age (Thomas et al. 2007; Widen & Russell 2003), mental health status (Jormann & Gotlib 2006; Mendlewicz et al. 2005; Persad & Polivy 1993), as well as the gender and clinical diagnosis of the encoder/interaction partner (Merten 1997), and the stimulus properties, for example motion (Ambadar, Schooler & Cohn 2005) and absence of characteristic components (Kohler et al. 2004). Context also plays a role: as background information (Fernández-Dols & Carroll 1997), textual description of the situation (Carroll & Russell 1996), other FBs presented consecutively (Tanaka-Matsumi et al. 1995) or simultaneously (Russell & Fehr 1987). This multitude of parameters is a source of flexibility based on which the viewer's attributions adapt to the specific situation. But how does it happen?

Some authors have articulated accounts of the possible mechanisms involved. Russell (1997) suggests a sequencing of FB decoding in relation to emotion: perception of quasi-physical information (regarding facial and other actions of the expresser, context), perceptual judgement along the pleasure and arousal dimensions, construction of a story that explains the judgement and additional information available and that, if necessary, can be used for choosing an emotion label. Decoding is analyzed in terms of flexible and subjective hypotheses that best account for the existing data. Frijda & Tcherkassof (1997) state that the attribution of an emotional meaning to FB rarely involves categorization using emotion labels. More often, viewers imagine an emotionally charged situation that

fits the perception and is perceived as part of the person's interaction with the environment. Also, decoding involves at least three nonverbal processes: environmental expectation (the viewer searches for an object in the environment that matches the expectation evoked by the expresser's FB), affective response and behavioural expectation (the FB directly affects the viewer's emotional state and informs of possible corresponding behaviours in the future), empathic identification response (motor mimicry or a sense of identifying a similar response in one's own repertoire). Emotion understanding is viewed in terms of telling "that things may come from the things that are" (Frijda & Tcherkassof 1997: 94), while emotion attribution and categorization are processes that go beyond and build on nonverbal decoding. This view is related to the distinction between low road and high road systems in communication (Buck 1984, 1994, 1999). The low road system involves a direct decoding of FB, due to phylogenetic pre-tunements of the viewer's attentional and perceptual systems to particular displays and results in a non-propositional "feeling about the other," an awareness of the meaning in context. In the high road system, processing of the raw perceptual data results in propositional inferences. While high road systems are consistent with the initial model of FB and have been studied mostly via judgement studies, low road decoding and the interactions between the two systems during the development and the present interaction are more recent research topics related to the new focus on intersubjectivity.

Although these authors focus on emotion related mechanisms, it is acknowledged that FB can also prompt nonemotional interpretations. Bavelas and colleagues (Bavelas & Chovil 1997, 2000; Bavelas, Coates & Johnson 2000) place FB in the bigger context of face-to-face dialogue and discuss the collaborative nature of production and comprehension. Levinson (2006) includes FB as one of the "multimodal signal streams" (53) that interlock in very complex patterns in everyday conversations and are analyzed via both automatic and "reflexive thinking" (49) processes to achieve attribution of intention and thus iteratively converge on a shared understanding.

The research reviewed so far highlights the importance of both expresser's and viewer's roles in the interpretation of FB and a few general remarks are worth mentioning. First, although most research is related to

emotion, interpreting FB in terms of social interaction and communication is becoming an increasingly important aspect of the field. It is by now obvious that the degree of emotionality in a specific interaction can vary significantly even if we assume that human communication invariably implies emotionality. As the emotionality decreases, other factors may become more important for the interpretation of FB. Second, research is going beyond the search for universals towards the study of variation, which proves rewarding. Third, most studies report interaction effects between the factors measured. Therefore, it is not just a matter of adding up all determinants to generate meaning, interpretation of FB is a fleeting truth at the intersection of all influences. The question of how this intersubjective truth is created is the focus of the next section.

### *3.3. The Truth is in the Middle*

The picture sketched so far is overwhelmingly complex and obviously shows that there can be no simple model of FB, describing direct relations between meanings and facial configurations. Complex processes are active at both expresser and viewer level, but how do these two manage to agree upon a similar meaning, if not always, at least most of the time? Abandoning the initial assumption of an identical code demands an alternative explanation.

Fortunately, our understanding of communication has also evolved towards more complex models. After decades of searching for immovable and universal meanings of language in abstract settings, new theories are put forward to account for dialogue in daily life settings. Early endeavours to explain meaning beyond the dictionary definitions of words propose the notion of conversational implicatures: understanding a message also involves recognizing the communicative intention of the speaker, not only the content of the message itself (Grice 1957). The speakers (to construct their messages) and the listeners (to infer the speaker's intentions) are relying on the conventional meaning of the message (the communicative intentions usually related to its use), the contextual information and the existence of a cooperative principle and several maxims of conversation related to truth, information, relevance and clarity (Grice 1975, as cited in Sperber & Wilson 1995). The maxim of relevance was further developed

by Sperber & Wilson (1995) into a cognitive account of communication as highly dependent on the context shared by the participants: the correct interpretation of a message is the one that involves a minimal cognitive effort and maximal cognitive effects, based on the assumption that the message is intended as maximally relevant.

More recent approaches to communication add to the role of context an emphasis on the interaction. Clark (1996) views communication as a collaborative action, where coordination occurs on the basis of common ground, coordination devices and coordination strategies. Common ground represents the awareness of information that is available to all interactants based on their belonging to the same cultural group or to the personal history of interaction. Coordination devices consist of conventional signalling systems, which describe regularities of behaviour such as language, and nonconventional devices, based on explicit agreement, precedent or perceptual salience. Coordination strategies ensure the synchrony of communication by dividing it into phases with jointly salient entry and exit times. Anolli (2002) highlights the “dynamic and contingent nature of meaning-making” (8) and replaces the distinction between communication and miscommunication with a unitary account of the phenomenon: a plurality of interpretations can emerge in a single interaction in the interplay between meaning stability and meaning flexibility, multiplicity of signalling systems and centralisation of processing mechanisms, production and comprehension processes, and their temporal synchronization. Recent accounts of dialogue at a linguistic level also highlight its interactive nature and the role of unconscious processes in establishing joint understanding (for example, see Pickering & Garrod 2004, for a discussion on the role of priming and imitation in “interactive alignment”). These theoretical developments make possible the interpretation of FB within a flexible framework that acknowledges the intersubjective nature face-to-face interaction.

Research in developmental psychology brings support to these interactive accounts. Trevarthen & Aitken (2001) review the literature on infant intersubjectivity and parent-infant communication and emphasize the infant’s innate readiness for actively stimulating and regulating interaction with the adult caregiver. At the level of FB, this manifests as spontaneous appeals and innovative imitation which appear driven by

intersubjective motives and are specialized for negotiation and learning social habits and conventions. The sequences of parent-infant exchange have complex coordinated rhythmic patterns where both interactants participate in defining the course of events. This interaction makes possible socioemotional learning. Indeed, the meaning of a facial configuration emerges ontogenetically from regularities in infant-carer exchanges and reflects the interrelationships between multiple components of a self-organizing dynamic system (Messinger, Fogel & Dickson 1997); the viewers' consensus in labelling a specific facial configuration indicates its probabilistic relation to such a dynamic system. In brief, this research suggests that the current meaning of FB during an interaction is the result of a process that transforms the innate potential for communication into shared knowledge and interaction abilities, which form the basis for flexible and creative exchanges in the present dialogue.

#### *3.4. Summary – Emerging Features*

An attempt to put all the pieces of the puzzle together suggests an account of FB that considers all participants in the interaction as well as the context, the meaning of FB being dynamically created. Several features of an emerging new model can be identified:

1. Both expresser and viewer are active participants in meaning creation;
2. Production and comprehension of FB happen at various interacting levels of consciousness;
3. Production and comprehension of FB are influenced by numerous interacting factors related to individual differences, immediate context, culture, etc.;
4. The development of FB relies on shaping the innate potential for communication through experiencing interactions;
5. A limited set of facial actions pertains to the adaptive tasks related to social or non-social interactions (and have been so far mainly interpreted within theories of emotion), but FB also has other functions (communication, feeding, etc.);
6. The interpretation of FB in interaction is a collaborative process with stable and flexible features.

So far, FB has been subsumed to either emotion or communication theories and research, and the features mentioned above are a consequence of this approach. As discussed in the previous sections, FB is only one of the streams used in face-to-face interaction. Therefore a multimodality analysis would be most appropriate for the interpretation of FB in particular contexts. However, it is equally important to investigate its unique features and develop a dedicated and comprehensive model.

#### 4. Implications for the Study of FB in Communication

I have so far focused on FB as an explanandum, but it is often used as part of the explanans, in which case inferences based on it must take into account what is known so far. What follows is not meant to be an exhaustive list, but an exemplification of research considerations, with a focus on the implications of our current understanding for future studies.

First, it is obvious that facial configurations do not have intrinsic meanings. There is no such thing as “facial expression of anger,” unless it stands as shorthand for previously qualified statements in specific contexts. Using a similar interpretation in a new context is not self-evident, but needs to be supported by a careful consideration of prior research. As FB has been shown to be sensitive to changes in multiple influences, including individual differences and context, it is important to mention that, under careful experimental conditions, controlling all but one factor, FB has the potential to be a good indicator of that specific factor. Although reliability and validity are difficult to ensure, these issues of inference and measurement apply to scientific enquiry in general (Cacioppo, Tassinary & Berntson 2000).

Second, any theoretical standpoints or assumptions are not self-evident, as FB can be researched from various perspectives. Therefore, theoretical choices, limits of generalization, and particular behaviours researched need to be spelled out and reflected in the choice of methodology.

Third, any analysis, even if focused on the FB of a single individual, needs to adopt a larger perspective. FB is placing the individuals in a communicative network, therefore their behaviour has determinants and consequences in their social relationships. It is less about an intrinsic characteristic of an individual and more about the whole communication

context in which the individual is placed. Individual differences in facial display perception or production are a result of the personal history of interaction shaping the innate communication potential and can be due to multiple interacting factors related to the individual, the situation and the participants. Also, they reflect the current situation and participate in the creation of present and future exchanges. From this perspective, social intelligence and emotional intelligence, in their FB expression and perception aspects, are not an ability to decode a message that is invariably there. They reflect a match of the individual's views with those of a majority, a proneness to participate to a commonly created social reality, a shared knowledge which eases communication with consequences for the individual's social relationships and emotional life.

Fourth, considering alternative interpretations of FB is essential. For example in the microanalysis of interaction a single sequence of FB can have multiple interpretations. "The best" can be the one that enables the generation of a new level of knowledge about the interactants, knowledge that allows a progression towards a goal. In a therapeutic situation, a "correct" interpretation will enable a reaction from the part of the therapist that modifies the relationship in such a way that the patient gains new adaptive skills to apply in other social interactions, or a reaction that ensures a secure bond.

Fifth, considering other modalities in research in addition to FB increases the chances that the interpretations chosen better represent the situation studied. The message is not solely on the face, in gestures, words, or voice, although some elements might play a more decisive role in the selection of alternative hypotheses about the participants' intentions. The meaning is emerging in an iterative process from the interaction itself.

The prospect of integrating knowledge about FB into communication training has motivated numerous studies, especially in clinical settings (e.g. Ekman, Matsumoto & Friesen 2005). However, according to the current understanding of FB, such training would not benefit significantly from adding to the curriculum a list of FB-emotion codes associated with diagnosis categories. A more adequate approach would involve changing the theoretical framework in which therapeutic communication is perceived. By learning to pay attention to multiple channels, to integrate all this additional information in the generation of alternative hypotheses

and to test these hypotheses in the therapeutic interaction, the therapist would be able to reach novel interpretations that encourage change.

Encouraging understanding of both the stable and flexible aspects of FB in communication and its multiple determinations better reflects our emerging understanding of the complexity of human interaction. The field of intersubjectivity has a long road ahead until it will expose and be able to influence the mechanisms by which ordinary acts like everyday conversations bind us together in such an effective way. A clear and updated model of FB is more likely to help this endeavour by framing research questions in accordance with existing findings and by stimulating the use of theoretically consistent methodology.

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