

RUNNING HEAD: Emotion expression vs. motive communication

Do Facial Movements Express Emotions or Communicate Motives?

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Abstract

This paper addresses the debate between emotion-expression and motive-communication approaches to facial movements, focusing on Ekman's and Fridlund's contrasting models and their historical antecedents. Available evidence suggests that the presence of others either reduces or increases facial responses, depending on the quality and strength of the emotional manipulation and on the nature of the relationship between interactants. Although both display rules and social motives provide viable explanations of audience "inhibition" effects, some audience facilitation effects are less easily accommodated within an emotion-expression perspective. In particular, emotion is not a sufficient condition for a corresponding "expression" even discounting explicit regulation, and apparently "spontaneous" facial movements may be facilitated by the presence of others. Further, there is no direct evidence that any particular facial movement provides an unambiguous expression of a specific emotion. However, information communicated by facial movements is not necessarily extrinsic to emotion. Facial movements not only transmit emotion-relevant information but also contribute to ongoing processes of emotional action in accordance with pragmatic theories.

Do Facial Movements Express Emotions or Communicate Motives?

What's in a smile, a scowl, a grimace? People attach a variety of meanings to faces. Some of their attributions accurately reflect what another person is actually feeling, thinking, or doing, whereas other inferences are of more dubious validity. For example, we are capable of detecting quite precisely the direction of someone's visual attention (e.g., Kobayashi & Kohshima, 1997; Rutter, 1987), and register at an implicit level how closely attuned their facial movements are to those of others, including ourselves (e.g., Bernieri, Davis, Rosenthal, & Knee, 1994; Bernieri, Reznick, & Rosenthal, 1988). However, many of our conclusions about a person's character, attitude, or intentions based on first impressions of their facial features later turn out to be false. Further, although we believe that seeing someone's face helps us determine whether they are telling the truth, in fact most people are relatively poor at detecting deception from nonverbal cues, including facial movements (e.g., Zuckerman, DePaulo, & Rosenthal, 1981). How much, then, do we read into faces and how much do we read out from them (Russell, 1997)? In particular, does our deeply held conviction that faces express emotions fall into the former or the latter category? How well can we tell what people are feeling simply by looking at their faces?

Since the 1990s, the familiar view that faces directly express emotions has come under increasing scrutiny (e.g., Russell & Fernández-Dols, 1997; Russell, Bachorowski, & Fernández-Dols, 2003). Perhaps the most influential alternative is that faces are not surfaces on which private affective meanings are somehow made visible but rather tools for communicating social motives to specific addressees (Fridlund, 1994). According to this view, the idea of expression as an outpouring of something that was first inside is misleading (see also Ekman, Friesen, & Ellsworth, 1972, p.3). Emotion does not leak out into the interpersonal world. Instead, intentions are shared, transmitted, or co-ordinated between faces. Thus, my "angry" display serves as a warning to you to back off in case I attack (Fridlund, 1994), regardless of what emotion I happen to be experiencing. Further, experiencing anger does not automatically produce an impulse to make this expression, unless I also have an aggressive social motive, and unless there is someone else around to whom the aggressive message might appropriately be transmitted.

In this paper, I review arguments and evidence bearing on the issue of whether faces express emotions or communicate motives and intentions. I want to draw three basic conclusions. The first is that many supposedly emotional facial movements cannot be explained simply in terms of emotions and display rules. The second is that some apparent advantages of the alternative motive-communication account are partly undermined by its underspecification of the central concepts of social motive and audience attunement. Third and finally, a fuller articulation of dynamic emotion processes in their interpersonal context may render many (but not all) of the distinctions between emotions and social motives redundant. My central aim is to point the way toward a more

comprehensive account of facial movement in social interaction that properly situates emotional communication in its everyday functional context.

The paper is structured in five main sections. In the first historical section, I discuss Darwin's theory as a precursor of the contemporary emotion-expression view, and Dewey and Mead's pragmatist accounts as forerunners of the motive-communicative approach. Second, I present Ekman's and Fridlund's competing contemporary theories in more detail. Third, I provide a brief review of the various sources of evidence that emotions and expressions are directly linked, and conclude that they provide direct support only for a probabilistic connection. In the fourth and central section, I evaluate empirical literature addressing how the presence of other people influences facial movements, focusing on evidence for audience inhibition and facilitation. This evidence is more readily accommodated within a motive-communication paradigm, but this is partly because of the flexibility of some of its concepts. Fifth, I re-evaluate the theories on conceptual as well as empirical grounds, drawing on the ideas and findings presented earlier.

Early Theories

Charles Darwin's Three Principles

Darwin (1872/1998) outlined three reasons why particular facial movements may have become associated with specific emotions over the course of the history of the human species. The first principle ("of associated serviceable habits") was that facial movements that are read as expressing emotion originally served direct adaptive functions in specific emotion-related situations. For example, visual input may be rejected by closing the eyelids or moving the head so that attention is directed elsewhere. Over time, according to Darwin, these same movements became associated not just with stimuli that actually required direct rejection but also with rejection-related feelings. More generally, faces that had once served a practical function also came to occur in situations where this function no longer applied.

Darwin's second "principle of antithesis" was that movements "opposite" to these serviceable habits, somehow became associated with contrasting feeling states. Darwin wavers about the processes underlying the operation of this second principle, but provides at least one example that suggests that the facial movements in question may serve *communicative* functions. He describes how animals facing potentially dangerous assailants adopt a submissive attitude that is maximally distinctive from a confrontational attitude. Instead of "erecting its hair, thus increasing the apparent bulk of its body, ... showing its teeth, or brandishing its horns" (p. 57), the animal will cower, make itself appear smaller, and cover its fangs. The purpose is apparently to show the antagonist that no challenge is presented. Similarly, many human facial movements may serve to indicate to other people what is *not*, rather than what *is*, likely to happen. Although Darwin mentions "the power of intercommunication" (p. 63) as a possible basis for these antithetical

movements, his central claim is that the movements are no longer serviceable, but instead are side-effects of previously relevant associations and counterassociations.

The principle of antithesis may deserve more attention than it has attracted since Darwin's time. Its promise lies in the notion that the signifiers of facial language may derive their meaning as part of a system of differences rather than by any direct reference to a signified object (cf. de Saussure, 1974). Perhaps one of the points of a smile, for example, is to be visibly as different as possible from a range of other facial positions (see Ekman's editorial commentary in Darwin, 1987/1998, pp. 63-64, and Ekman & Hager, 1979). However, if this interpretation is correct, it is not strictly antithesis that is important in shaping facial signals, but rather discriminability.

Darwin's third principle ("of action of the nervous system") proposes that some emotion-revealing facial information derives from symptoms of sensory excitation, when "nerve force is generated in excess" (p. 29). In more contemporary terms, facial flushing, muscle tension and so on, may be relatively direct consequences of the physiological changes that are often either side-effects or components of emotional states.

Darwin's analysis was never intended to explain why facial movements evolved specifically to express emotions. Instead he wanted to account for the apparently obvious connections between emotion and expression without conceding that faces provided a window to the soul. Indeed, if the purpose of facial movements were to reveal feelings, then the possibility that a deity had *designed* them for that purpose would obviously remain (cf. Burkhardt, 1979; Fridlund, 1994). Accordingly, none of Darwin's principles implies any intrinsic emotion-expression connection since the movements originated from factors that happened to correlate with emotions rather than emotions themselves. In this sense, Darwin apparently did not believe that facial movements give a direct and natural expression to an inner state: "Even such words as 'certain movements serve as a means of expression' are apt to mislead, as they imply that this was their primary purpose or object. This, however, seems rarely or never to have been the case; the movements having been at first either of some direct use or the indirect effect of the excited state of the sensorium" (Darwin, 1872/1998, p. 352). Along similar lines, Tomkins (1995, pp. 90-91) later argued that "communication of affect is a secondary spin-off function rather than [the face's] primary function."

Further, Darwin denied that *any* of the functions attributed to facial movements continued to operate in contemporary contexts (see also Russell et al., 2003). He saw expressions either as vestiges that no longer offered any practical advantage to their bearers or as side-effects of processes peripherally associated with emotion. This claim too may have been intended to ward off potential counterattacks from those believing that expressions were god-given. If facial movements actually did serve useful functions, then their origins could be explained in terms of divine beneficence (see Fridlund, 1994). The unfortunate consequence of Darwin's defensive position,

however, is that any current practical or communicative benefits of facial movements are disregarded. In fact, many emotion-connoting faces do arise as part of still serviceable actions or as signals that continue to provide useful information. For example, the fixed stare characterizing “angry” faces maintains visual attention on antagonists, and informs these antagonists that their actions are being monitored.

Setting aside Darwin’s unwarranted attempt to deny continuing functionality, he succeeded in identifying three general reasons why facial movements may be associated with emotions: 1) because of the direct practical functions that they serve (or once served) in emotional actions; 2) because they provide (or once provided) information about the probability of emotional actions to other animals; and 3) because they are side-effects of some extrinsic aspect of emotional function. All three of these principles remain viable although they do not entirely exhaust the range of possible explanations for emotion-face connections. For instance, a fourth possibility might be that facial movements play a direct role in emotion regulation and control (e.g., Izard, 1990). Indeed, some theorists believe that facial movements contribute to the production of emotion rather than arising as a consequence of an already activated emotional response (e.g., Tomkins, 1962; Zajonc, Murphy, & Inglehart, 1989). However, in this paper, my main focus is on the two most discussed functions for facial movement, the practical and the communicative, and on their relation to emotion.

John Dewey and Pragmatic Actions

Instead of starting from the assumption that facial movements reflect emotion, Dewey’s pragmatist approach led him to emphasize instead Darwin’s ideas about the direct functional significance of some facial movements in carrying out actions. For example, closing the eyes or turning away could genuinely contribute to an act of rejection, rather than being evolutionary remnants of an ancestor’s movements that happened to occur in association with rejecting feelings. Perhaps, then, the direct practical functions of facial movements are more important in explaining their origins than any accidental association with emotion.

One of Dewey’s (1894) aims was to combine Darwin’s insights about facial expression with William James’s (1884) ideas about the causes of emotion itself. According to James, facial movements (like other bodily changes) were not a consequence of being emotional, but rather direct reactions to emotional situations that were then internally perceived as emotion. Thus, we do not smile because we are happy in this view; rather, we feel happy because we are smiling (cf. Laird & Bresler, 1990). If this feedback theory is correct, then the idea that faces express pre-existing emotions must be misconceived.

However, Dewey believed that there were also problems with feedback theory’s explanation of the initial bodily reactions. James had argued that these were elicited by the “perception of the

exciting fact,” but (in Dewey’s view) failed to specify exactly what made the fact exciting in the first place. Confronted by a bear, for example, how does the body know what responses to produce in order to generate an appropriate fear reaction? The obvious answer is that the bear is already perceived (or “autoappraised,” Ekman, 2003) as a frightening bear, before any bodily changes are felt (cf. Ellsworth, 1994). But perception of a bear as frightening seems to imply that an emotion is present prior to the bodily changes, thereby undermining the contention that these changes come first.

Darwin’s explanations of the functions of expressive movements help to solve this problem. Rather than seeing the bear at once as frightening, we perceive it as something to run away from. More accurately, we are pursuing practical actions that the bear impedes and adjust our behavior accordingly. Facial movement is part of this adjustment and the emotion itself emerges in parallel with its development. Where James saw the exciting fact leading to the expression that in turn leads to the emotion, Dewey sees the object-directed action as coming first and the expression and emotion arising from it (“*the mode of behavior is the primary thing and ... the idea and the emotional excitation are constituted at one and the same time*” Dewey, 1895, p. 18, emphasis in original).

Dewey’s central argument is that Darwin’s interpretation of facial movements as serviceable habits provides sufficient explanation without any need for postulating an underlying emotion. Because preparing to attack already requires an aggressive posture, any consideration of anger becomes redundant (cf. Fridlund, 1994, and below): “in the case of ‘serviceable associated habits,’ the principle of explanation actually used, whatever the form of words employed, is that of survival, in the form of attitudes, of acts originally useful not *qua* expressing emotion, but *qua* acts – as serving life. ... *The reference to emotion in explaining the attitude is wholly irrelevant; the attitude of emotion is explained positively by reference to useful movements*” (Dewey, 1894, pp. 555-556, emphasis in original).

If facial movements are primarily constituents of action rather than expressions of emotion, then why do they often seem to carry emotional meaning? Dewey’s answer is that they are only expressions in the eye of the beholder: “We call it expression when looking at it from the standpoint of an observer ... To an onlooker my angry movements are expressions – signs, indications; but surely not to me ... In themselves, they are movements, acts, and must be treated as such if psychology is to take hold of them right end up” (p. 555).

Dewey’s distinction between actors’ and observers’ points of view may be too sharply drawn. In fact, people may learn to use their faces specifically to convey emotion-relevant meanings. Further, even when facial movements are not intended to express something in the first place, their reading by the other as expressions can bring consequences for us that may ultimately

change the nature of what we are doing (see below).

George Herbert Mead and Communication

Mead (1934) extended Darwinian ideas of the functions of gestures by explicitly considering their social impact, seeing them as a primitive form of the kind of “significant symbol” that permits the distinctively human characteristics of self-conscious mental life. For example, in a dog fight, two animals may circle one another, face-to-face, each apparently adjusting its posture in response to the antagonist’s changing stance. Here, Mead sees a rudimentary form of intercommunication. Because leaning forward, tensing muscles, and baring teeth are part of a more extended action that results in attack, the second dog is able to anticipate such an attack when these movements are made and therefore adjusts its own stance accordingly (backing off or adopting a confrontational posture). Further, the first dog registers the second dog’s response and may come to use its own preparatory movements precisely to achieve this reaction. The “meaning” of the movements for the first dog is defined by the movements that they “call out” in the second dog. The upshot is that the dogs are able to size each other up by registering indications of threatened attack before any kind of fight actually occurs. In short, postural and facial movements allow mutual co-ordination in an ongoing social act.

To the extent that human facial movements are involved in more articulated action sequences, a similar meaning-manufacturing process may operate in interpersonal life. My staring at an object that I am about to take hold of, for example, makes information about my nascent action available to any onlooker, even if its meaning is not explicitly encoded. It would be surprising if exposure to these interpersonal contingencies did not ultimately result in my appreciation that looking at something tells others something about what I am about to do. As a consequence, I may come to use looking not only to fix on objects before taking hold of them, but also to inform others of this intention, implicitly or otherwise.

For Mead, actions attain true symbolic significance when they call out identical responses in both actors and observers. However, he believed that this only happens in the case of human verbal language where speakers respond to essentially the same stimulus as hearers. By contrast, facial movements do not offer the same visual information to actors and observers, so their impact must remain at the more implicit level of mutual adjustment as exemplified in dog fights. However, according to Meltzoff and Borton (1979), even young babies are capable of perceiving that corresponding information from separate sensory modalities reflects an identical object (active intermodal mapping). It therefore seems plausible that proprioceptive feedback from one’s own face may be matched against visual information from someone else’s, especially if their movements show similar patterns over time (cf. Beebe, Jaffe, Feldstein, Mays, & Alson, 1985). Recent ideas about “mirror neurones” imply a similar conclusion (e.g., Rizzolatti, Fogassi, & Gallese, 2001).

Even discounting these basic relational capacities, it is certainly true that children learn to use facial movements to transmit meanings and to exert social influence in a more self-conscious way.

Mead's ideas take the understanding of facial movement forward by examining their ongoing role in social contexts. Their meaning derives not from a pre-existent mental state but from the way they play themselves out in unfolding interpersonal life. Two points are central: that facial meaning is often primarily oriented to the social world (e.g., Barrett & Campos, 1987), and that expressions usually derive their communicative value over the course of interactions with articulated temporal structure (e.g., Fogel, Nelson-Goens, Hsu, & Shapiro, 2000; Krause, Steimer-Krause, Merten, & Burkhard, 1998). Most emotion-based accounts of facial movements have paid too little attention to the role of interpersonal and dynamic factors in constructing meaning from faces.

Although Mead clearly spells out the conditions necessary for the development of communicative significance, he does not fully articulate the underlying process. During ontogenesis, associations presumably develop between movements and their interpersonal consequences that ultimately lead to their self-conscious use as communicative actions, but what exactly leads to this transformation of function? Vygotsky's (e.g., 1978) parallel theoretical work provides part of the answer. His explanation of the development of deliberate pointing ran as follows:

The child attempts to grasp an object beyond his reach; his hands, stretched towards the object, remain poised in the air. His fingers make grasping movements. At this initial stage, pointing is represented by the child's movement, which seems to be pointing to an object -- that and nothing more.

When the caregiver comes to the child's aid and realizes that his movement indicates something, the situation changes fundamentally. Pointing becomes a gesture for others. The child's unsuccessful attempt produces a reaction not from the object he seeks but *from another person*. Consequently, the primary meaning of that unsuccessful grasping movement is established by others. Only later, when the child can link his unsuccessful grasping movement to the external situation as a whole, does he begin to understand the movement as pointing. At this juncture, there occurs a change in that movement's function: from an objective object-oriented movement, it becomes a movement aimed at another person, a means of establishing relations. (1978, p. 56, emphasis in original)

In simple terms, this account suggests three stages in the development of pointing: First an action serves the direct practical function of attempting to change the physical world. Second, others attribute intention to this action and react accordingly (i.e., by giving the child what it is pointing to). Third, the action takes on the secondary function of communicating its intention, which is internalized as its true meaning.

Although Vygotsky's analysis of the development of pointing underestimates the extent to which infants appreciate the interpersonal implications of their movements from birth (e.g., Rönqvist & von Hofsten, 1994), the same general principle may still apply in other contexts.

Perceptible social effects of any movement change its functional character and thus impact on its meaning. In particular, other people's interpretations of our facial movements are bound to influence the way we come to use these movements.

Mead and Vygotsky independently converged on the conclusion that mental processes develop from prior interpersonal processes. Both also assumed that, once developed, these processes become a primarily individual matter. Indeed, for Mead, the interchangeability of communicative positions leads to internalization of a "generalized other." Perhaps, however, even apparently private processes never entirely lose their interpersonal orientation, even if they are directed only towards imagined addressees. Meaning, including emotional meaning, may continue to be constructed from the ongoing business of interpersonal interaction even in fully socialized adults (cf. Parkinson, 2001).

Summary

This brief historical overview suggests a range of alternative interpretations of the meanings and functions of faces. According to Darwin, expressions have become associated with emotions for largely extrinsic reasons. According to Dewey, facial movements make a direct contribution to practical actions during emotional episodes. According to Mead, their central meaning lies in the extended sequence of actions they come to stand for, allowing them to be used implicitly for communicative purposes. For these latter pragmatic theories, facial movements do not express a prior emotion but are part of the process of acting emotionally (Dewey) or communicating emotion-related information (Mead).

Contemporary theories too focus on emotion, action, or communication as the basis for facial movement. Paul Ekman (e.g., 1973) takes a neo-Darwinian position by arguing that faces express emotions for adaptational reasons. By contrast, Alan Fridlund (e.g., 1994), like Dewey, criticises Darwin for discounting the continuing functionality of facial movements, which, like Mead, he sees as rooted in communication. Now, as before, there is disagreement about whether facial movements are linked to emotions (e.g., Ekman, 1972; Izard, 1977; Tomkins, 1962), or practical actions (e.g., Fridlund, 1994; Frijda & Tcherkassof, 1997), and about whether they are merely expressive or serve more flexible communicative purposes (e.g., Bavelas, Black, Lemery, & Mullett, 1989; Chovil, 1997; Fridlund, 1994). In the following sections, I focus particularly on Ekman's and Fridlund's opposing positions on these debates before evaluating relevant experimental and observational evidence.

Contemporary Theories

Ekman's Neurocultural Theory

Darwin's ideas about emotional expression have inspired many important psychological theories over the years (e.g., Buck, 1984; Izard, 1971). One of the most influential was devised by

Ekman (e.g., 1972), based on Tomkins' (1962) earlier pioneering work. Like Darwin, Ekman believed that facial movements derived their emotionally expressive functions from natural selection. However, unlike Darwin, Ekman proposed that some movements may have evolved precisely to express emotion rather than to serve other purposes that happen to be associated with emotional experience.

Ekman's view is that a hard-wired connection links each of the so-called basic emotions (happiness, sadness, fear, disgust, anger, surprise, and possibly contempt and shame) to a distinctive facial position. In particular, activation of the emotion initiates a facial affect program (FAP) that sends efferent impulses to the face. However, cultural learning partly determines the range of "elicitors" that will activate the emotion, and may moderate the impact of FAP impulses on actual facial movements. Thus, socialization teaches us what to get emotional about (although some elicitors are universal) and when to control expressions according to conventional *display rules* (although the underlying biological emotion may still leak out), but the core connection between the elicited emotion and its associated impulse to expression is preprogrammed by natural selection. Because Ekman's model acknowledges the impact of both nature and nurture, he calls it the *neurocultural* theory.

One of the main advantages of Ekman's theory is its capacity for explaining both similarities and differences in facial conduct across cultures. Instead of treating superficial inconsistencies in expression or recognition as direct counterevidence for universalist models, Ekman makes more precise claims about what might and might not be universal. By taking this theoretical step, Ekman helped to move the facial expression debate beyond the simplistic nature-nurture controversies that often characterized previous discussions. Instead of asking whether or not emotion expression is biologically determined, researchers now focus on the issue of what aspects of facial movements are biologically determined. Few researchers now dispute that some patterned muscular movements are directly inherited, for example (cf. Russell, 1995), but there is still debate about whether these are necessarily linked to emotions or to other more or less loosely correlated affective, motive-related, or situational factors.

Why should it have been adaptively advantageous for specifically emotional information to be revealed on faces? Ekman's (1972) account implies that the relevant muscle actions started out as functional or communicative movements (cf. Darwin, 1872/1998, and above). For example, facial changes while regurgitating unpleasant-tasting food became associated with anticipation of objects to be rejected more generally allowing their use in conveying rejection to others. Disgust as an emotion arose at some point in the phylogenetic development of this patterned action, and one of its components was facial movement. However, Ekman does not see the disgust face as simply being a part of a rejecting action (Dewey, 1894) or of a communication of rejection (Mead, 1934).

Instead, he sees it as an involuntary response that is part of the emotion of disgust itself. Indeed, Ekman (1998, p. 373) argues that emotion-expressing faces serve distinctive functions that partly explain this more specific connection: “emotional expressions are special ... because they are involuntary not intentional ... we trust them precisely because they are unintended.”

If involuntariness is important in the communicative value of facial movements (and consequently their evolutionary basis), then voluntary facial movements must be distinguishable from involuntary ones. In this regard, Ekman (1998) explicitly argues that “the signal doesn’t look exactly the same” (p. 373) when people deliberately produce facial expressions. For example, the supposedly natural and involuntary expression of happiness conveyed by Duchenne smiles involves tension in muscles surrounding the eyes (*orbiculares oculi*) that many people find difficult to control. Correspondingly, Ekman and Friesen (1982) found that people can often tell the difference between spontaneous and dissimulated smile.

In fact, there is no direct evidence that Duchenne smiles directly convey spontaneity as such rather than correlated factors such as emotion intensity (e.g., Messinger, 2002) or arousal (Fridlund, 1994). At any rate, the observation that humans sometimes register information relating to the deliberation behind movement, and that such information may be useful to them, does not imply that emotion itself is directly connected to facial expression. For one thing, not all instances of everyday emotion seem to be purely involuntary (e.g., we may work ourselves up into a state of excitement). For another, many recognizably involuntary facial movements bear no necessary relation to emotion (e.g., twitches, sneezes, and yawns). It may indeed be adaptively useful to distinguish such movements from more controlled movements, but that in itself is not enough to explain why emotions in particular need to be expressed. Further, conceding that many facial movements connoting emotion are involuntary or automatic does not imply that they are entirely dependent on emotion and nothing else. For example, Owren and Bachorowski (2001) argue that Duchenne smiles are biologically programmed honest signals of happiness that *also* depend on the presence of other people to receive them. Thus, faces might provide reliable and relevant information in a number of ways without depending exclusively on underlying emotional state.

Fridlund’s Behavioral Ecology Theory

Fridlund’s theory differs from Ekman’s in two basic respects. First, Fridlund argues that the function of facial movements is to *communicate* information to others rather than simply to *express* anything. Facial displays are thus intrinsically other-oriented messages rather than individual reactions. Second, he believes that the content of the communication is not directly about emotion, but rather concerns “behavioral intentions” or more generally “social motives.” In other words, the meaning of facial movements relates to how people are likely to act rather than their current subjective experience. The central idea is that giving out signals concerning internal states would

be of dubious adaptive value unless it led to specific conclusions about future behavior, whereas displaying social motives would allow other animals to make appropriate adjustments to displayers' actions.

In Fridlund's view, there is no one-to-one mapping of displays to emotions because the same emotion may be accompanied by quite different social motives under different circumstances (anger may result in a desire to aggress physically, to withdraw, or to undermine the other more subtly, and the display will be different in each case). Thus, the prototypical "anger" face occurs only if there is an overtly hostile intention, and if there is a suitable audience to receive the message, but not on other occasions when a person might be angry. Even here, the face does not express the emotion itself, but rather communicates an intention to aggress. Indeed the theory proposes that the so-called anger face might also occur when communicating an intention to aggress when there is no subjective experience of anger.

In developing this motive-communication account, Fridlund drew on evolutionary theories that treat facial movements as ritualized displays (e.g., Andrew, 1963). Ritualization occurs when a movement provides adaptively or reproductively relevant information to other animals making its progressive exaggeration beneficial. Correspondingly, perceptual sensitivity to the same informative movements is likely to enhance the probability of gene survival. Thus, although some aspects of facial movement and morphology may have developed specifically for communicative purposes, in most cases, the muscles used in displays probably started out serving some other function (e.g., control of sensory input, respiration, eating etc) and were later co-opted to serve communicative purposes too (in accordance with Darwin's first principle). For example, widening the eyes serves a direct purpose when a novel stimulus requires attention, but if the movement is made in a clearly visible way (and/or if other animals are attuned to its presence), it also tells others that something worthy of attention has happened. Along these lines, it has been argued that eyebrows evolved partly to underline attentive movements of this kind (see Buck, 1984). Similarly, the highly perceptible contrast between the white of the eye and the pupil facilitates the tracking of the direction of others' visual attention (cf. Kobayashi & Kohshima, 1997).

The basic argument, then, is that the cue value of anticipatory movements affords duly sensitive animals an adaptive advantage. If some of our ancestors happened to be more apt to register these movements, and could thereby adjust more quickly to interpersonal exchanges, then this fact may have correspondingly increased their chances of survival. Further, to the extent that sending out informative signals also facilitates co-ordination of action or adjustment to others' conduct, it seems plausible that facial movements may have co-evolved with perceptual attunement to the messages they convey on the part of perceivers (see Fridlund, 1994). Fridlund (1991a, p. 20) uses the following story to explain these parallel origins of display and sensitivity to display:

Millions of years ago, if you crossed my turf, I might bite your head off [at some risk to me, if you decided to retaliate]. If you had advance warning, you might escape death through retreat or protective defense, and we'd both survive.

But you'd need cues to retreat or protect. I'd have to give them, and you'd have to notice them. Here's the scenario: because of a lucky gene, I adventitiously bared one tooth for ½ second before I pounced. Your lucky gene made you look at my head. I bared my tooth, and you looked in the right place, not because I wanted to display my feelings, or because you wanted to see how I felt. We both acted out of pure dumb genetic luck. That we survived our skirmish increases the chances that our lucky genes will proliferate, and that my odd tooth-baring and your odd vigilance for it will both disseminate in our progeny.

Of course, something is missing from this creation myth, namely an explanation of why this particular display happened prior to the action that followed. Any fortuitous and idiosyncratic movement would be unlikely to spread to a whole species or subspecies. Fridlund (1994) therefore proposes that the relevant signals start out as actions, sensory adjustments, or consummatory behaviours that later become ritualized ("my example posits random origins for the display; real-world origins are without doubt nonrandom – in other words, they originate in preadapted movements," p. 20).

But Fridlund does not develop a non-random account of the origins of the receiver's co-evolved sensitivity to the signal. In fact, the usefulness of the sender's signal must depend on where the receiver's attention is likely to be focused at this stage of this kind of encounter. Further, mere sensitivity to informative displays is not sufficient for survival relevance: it is also necessary for the receiver to act on their implications. Unless detection of the bared tooth leads to some kind of escape or appeasement, it can make no difference to the probabilities of inheritance. For both of these reasons, the signal value of displays probably derives from their embedding in more articulated actions as implied by Mead's writings.

However, consideration of how "displays" function in real-time unfolding contexts makes it harder to see them exclusively as signals. Rather than flashing on a message concerning what they are about to do, animals presumably make continual adjustments to each other's ongoing movements in a process of mutual co-ordination. No part of this process reflects a *pure* communicative function divorced from joint practical activity. Of course, it is entirely possible that fragments of meaningful action acquire significance outside their original context and can then be used to direct another's actions at a distance. But even here, it may be that their original functions also continue to shape their delivery. Any claim that facial displays *always* communicate social motives and *never* express emotions, then, would deny the apparent multifunctionality of their operation.

Some commentators have argued that Fridlund's ideas about co-evolution underestimate the implication of the "arms race" between senders and receivers that arises from their direct competition for gene survival (Owren & Bachorowski, 2001). In the example presented above, it

might actually benefit the first animal (the “manipulator” in Krebs & Dawkins’ [1984] terms) most to give off a signal that would cause the second animal (“mindreader”) to back down even when the latter was likely to win any ensuing fight. On the other hand, the second animal would need to be sensitive to this possibility of dishonest signalling in order to maximise its own reproductive potential. Many theories therefore argue that reliably informative displays only emerge when competition to influence discriminating receivers necessitates their use (e.g., Zahavi, 1975). The resulting signals guarantee their honesty by being costly, risky, or difficult to control, and are thus more likely to influence otherwise sceptical audiences.

Following these principles, Owren and Bachorowski argue that part of the point of an emotion-dependent signalling system is to underwrite the authenticity of facial movements. In particular, they argue that Duchenne smiles evolved as an honest indicator of positive affect, but that the subsequently emerging ability to simulate aspects of this display led to the natural selection of a more effortful and articulated facial and vocal complex involving rhythmic laughter. However, accurate reading of another’s positive affect does not guarantee successful co-operation with that person. More generally, receivers’ problems in verifying honest signals are mitigated by their active role in ongoing negotiation with senders and by attention to how displays unfold responsively in context (cf. Gibson, 1979). Indeed, although there are often problems in detecting unreliable signals in advance (prereliance detection), subsequent outcomes often resolve any uncertainty (postreliance detection) and may lead to responses from others that increase the costs of a wholly deceptive strategy (Andrews, 2002). Finally, as Fridlund (1994) points out, there are many circumstances under which cooperation actually does benefit both manipulators and mind-readers in the long run (Smith, 1986).

Another issue for Fridlund’s theory arises from the obvious fact that people sometimes display emotion-related faces even when they are alone. Indeed, some people seem to cry more in private than in public, and most people smile, frown, blush, or show surprise in situations that involve no direct interpersonal interaction (e.g., while speaking on the telephone, reading a book, watching television, or remembering emotional events in private). If facial movements communicate social motives, then what is the point of making these movements when no others are there to receive the communication? Fridlund’s response is to question whether sociality is something that can ever be totally absent from a situation. Like Mead, he argues that even private actions are conducted with someone else in mind, even if that someone is simply the “generalized other” (Mead, 1934). With respect to facial movements, our displays may be oriented to imagined audiences, our parents, absent lovers or friends, antagonists, heroes or heroines. Further, Fridlund argues that the imagined presence of another modulates facial movement in similar ways to their actual presence (Fridlund, 1991b, and see below). However, this raises the question of whether the

effects of imagined others on communication of social motives can be distinguished from their impact on related private emotions. If an internal audience is congenial to an intended message then might they not also encourage the stronger imagination of the emotional consequences of what is happening? More generally, Fridlund's focus on facial displays whose primary function is communicate may underestimate the direct practical functionality of some apparently emotional facial movements.

Summary

Fridlund's and Ekman's theories seem to represent starkly contrasting positions on the issue of how tightly facial movements are linked to emotion. For Fridlund, emotion is imperfectly correlated with so-called emotion expression for two reasons. First, without an addressee, there is no point to the display. Second, displays convey social motives, which have only a contingent and extrinsic relation to emotion itself. For Ekman, on the other hand, the main point of many facial movements is precisely to express emotion. The connection between the two is intrinsic, direct, and automatic. Indeed, the partial uncontrollability of the emotion-expression link is part of what makes emotion expression such a valuable adaptive function.

Clearly, these two stances do not exhaust the range of possible connections between emotions and facial movements. For example, Frijda and Tcherkassof (1997) follow Dewey in proposing that facial movements reflect action tendencies in a way that is partly compatible with the behavioral ecology account. However, unlike Fridlund (and Darwin before him), they believe that these action tendencies are directly implicated in emotions themselves. Part of the disagreement between theories, then, relates to how emotion is conceptualised rather than to the specific kind of information that faces convey. Fridlund takes Darwin's lead in seeing emotions as subjective feelings divorced from behaviour, whereas many contemporary emotion theorists define emotions as multicomponent phenomena that *include* action tendencies and sometimes even facial movements themselves (see, for example, Ekman, 1989; Izard, 1994; 1997). This issue of how "emotions" and "social motives" are conceptualized by different theorists will be discussed later in this paper.

Setting aside the definitional inconsistencies, several substantive differences between the theoretical approaches offered by Ekman and Fridlund remain, and each makes different predictions about the variables that should influence facial movements. The next section reviews the evidence relating to the impact of emotion on facial movements, and the following one assesses the impact of the interpersonal context.

Evidence for Direct Emotion-Expression Connections

The most obvious disagreement between Ekman and Fridlund concerns whether or not any facial movements are directly linked to emotion. Fridlund argues that any connection is a fortuitous

consequence of the loose association between social motives and emotions. By contrast, Ekman argues that a distinctive subset of facial positions has intrinsic connections with “basic emotions.” This is not to deny that faces can do things apart from express these emotions. Indeed, Ekman (1979) has developed useful accounts of facial movements as conversational emblems and illustrators and analysed non-emotional facial reflexes such as those involved in the startle response (Ekman, Friesen, & Simons, 1985). However, according to Ekman, the central adaptive function of *some* facial positions is to express emotions. What is the evidence for this claim?

Cross-cultural Emotion Attribution

If Ekman is correct in postulating a direct biologically determined emotion-expression connection, we would expect all humans to show the same facial response whenever the emotion has been initiated (by whatever means) as long as the impact of display rules is minimized, and as long as there are no competing emotional impulses at the time. Unfortunately, hardly any studies have directly addressed this hypothesis (see Russell & Fernández-Dols, 1997). One reason for the lack of data arises from difficulties in specifying and manipulating situations in which the same set of unadulterated emotions are consistently experienced across all societies without any concurrent motives for suppression. In practice, it would be extremely difficult to develop criteria for standardizing emotion-producing situations cross-culturally (Galati, Scherer, & Ricci-Bitti, 1997) while avoiding social pressures to mask, intensify, or attenuate facial responses.

A second, less direct implication of Ekman’s model is that perceivers should either learn or instinctively know the putatively “correct” emotional meaning of relevant facial movements regardless of their cultural origins. A number of studies have therefore assessed the cross-cultural consistency of emotion attribution to faces supposedly showing the canonical expression of six or so basic emotions (e.g., Boucher & Carlson, 1980; Ekman & Friesen, 1971; Ekman, Sorenson, & Friesen, 1969; Izard, 1971).

This literature has been extensively reviewed and debated elsewhere (e.g., Elfenbein & Ambady, 2003; Haidt & Keltner, 1999; Russell, 1994). Perhaps the only indisputable conclusion is that the level of cross-cultural consistency in judgements of faces is sufficient to rule out the idea that facial positions are entirely arbitrary signifiers with no relation whatsoever to emotional state (Russell, 1995). Even people from isolated cultures are able to derive emotionally relevant information from pictures of Western faces. In other words, people seem to know *something* about the emotional connotations of certain facial positions regardless of their level of exposure to Western conventions. “Recognition accuracy” does not wholly depend on learning what expressions are supposed to mean in a particular culture.

However, the absolute levels of agreement across cultures about the emotional meaning of particular faces are not always impressive (e.g., Russell, 1994). Although there are potential

problems with finding appropriate translations for emotion words, and removing the effects of cultural display rules on both production and perception of faces, it still remains difficult to explain why there are differences between cultures and between emotions in so-called accuracy scores if Ekman's theory is correct. For example, if both disgust and happiness have equivalent status as basic emotions that are directly connected to canonical displays, why should participants from preliterate societies in Ekman and colleagues' (1969) study categorize a Western "disgust" expression as disgust on less than 30% of trials (given only six possible response options), but classify a Western "happiness" expression as happiness on more than 90% of trials (Russell, 1994)? Further, Elfenbein and Ambady (2003) present evidence that facial communication between members of the same culture or subculture is reliably more consistent than communication between members of different groups. More generally, the degree of consistency in emotion attribution between dissimilar societies (for all emotions with the possible exception of happiness) is not strong enough to rule out the alternative interpretation that participants make approximate inferences about emotional meaning on the basis of the information faces provide about attention, activation, liking, and/or intended action (e.g., Carroll & Russell, 1996; Russell, 1994; 1995). Although these latter factors have some diagnostic value as correlates of emotion, none of them specifies the precise category of emotion conveyed by faces.

Do perceivers interpret facial patterns emotionally when alternative meanings are available? Frijda (1953) found that spontaneous open-ended judgements about still or motion pictures of facial movements often referred to situations that might have provoked the observed responses and that emotional interpretations were only offered later, if at all. For example, a facial movement recorded in a tense and anxious situation was described by one participant in the following terms: "As if looking at something with fixed attention, a game or something, tense, two cars which almost get into collision, but nothing happens" (p. 314). Subsequent questioning revealed that this participant had specifically imagined what the person had been doing when moving her face in this way, rather than basing her description on an immediate emotional impression.

Yik and Russell (1999) showed that participants from Canada, Hong Kong, and Japan were able to allocate expressions to corresponding categories of social motive about as successfully as to Ekman's predicted "basic" emotions. By contrast, Horstmann (2003) found that when participants were provided with a choice about whether faces represented a "feeling state that the person was experiencing," "what the person is going to do next,"¹ or "what the person wants you to do," they showed a substantial preference for the emotional interpretation (except that German participants more commonly interpreted the "anger" expression in terms of behavioral intention). However, attributing a face to an experienced feeling state does not necessarily imply a specific basic emotion. Further, the relative preference for this option may have partly reflected its greater

flexibility of meaning. Finally, Horstmann's pictures were mainly posed, and participants may have inferred that they were being used deliberately to convey emotion. Knowing that a face is conventionally associated with an emotional meaning, however, does not imply that emotional meaning is inferred when no communication is intended (e.g., Fernández-Dols & Ruiz-Belda, 1997).

Developmental Evidence

Another potential source of evidence comes from studies of the emergence of facial patterns during infancy. If full-blown facial expressions were found to occur in appropriate emotional circumstances under conditions where social learning was not a viable alternative explanation, then this would clearly support Ekman's analysis.

Research by Eibl-Eibesfeldt (1972) showed that children born both deaf and blind adopt facial positions such as "anger" and "surprise" faces, and smiles in circumstances that would be plausible occasions for the corresponding emotions. Eibl-Eibesfeldt points out that these facial movements could not easily have been learnt by copying adult facial movements, especially since two of the studied children had deformed limbs as a result of thalidomide exposure during pregnancy and therefore were unable even to feel other people's faces with their hands. However, selective shaping of individual muscular responses by social reinforcement cannot be ruled out entirely (see Fridlund, 1994).

Few contemporary investigators would dispute that there is some genetic basis for facial patterning. However, there is disagreement about whether the patterns correspond to emotions rather than other correlated variables, such as social motives. Without direct evidence that the presence of an emotion per se automatically and consistently produces the facial movement, the data must remain inconclusive.

Camras, Malatesta, and Izard (1991) provided a comprehensive review of evidence concerning development of facial movements during infancy. They concluded that the association between emotions and corresponding "expressions" is often low. For example, Izard's theoretically predicted facial configuration for fear occurs in only 6% of 10-12-month-old infants who are confronted by strangers or visual cliffs (Hiatt, Campos, & Emde, 1979) and at similar frequencies in younger infants when a previously reinforced action frustratingly fails to produce a reward (Sullivan & Lewis, 1988).

Camras (1992) observed that young infants tend to show a generic distress face in response to a variety of unpleasant emotional events, with differences in patterning reflecting the intensity rather than quality of stimulation. Only later, do more differentiated emotional "expressions" become attuned to the specifics of emotional situations. Although a gradual maturation of basic emotions might potentially explain their gradual emergence (e.g., Izard & Malatesta, 1987), the

more obvious explanation is that facial communication partly derives from experience with interactions with the social and physical environment. Research that closely tracks the relative correspondence of developmental processes relating to sociality, emotionality and facial patterning might disambiguate this evidence.

Comparable problems of interpretation also characterise developmental data concerning responses to perceived facial patterns. For example, infants' preferential looking towards smiling faces from the age of four months (e.g., LaBarbera, Izard, Vietze, & Parisi, 1976; Wilcox & Clayton, 1968) certainly suggests that smiles embody a pleasant or interesting stimulus configuration. However, the evidence does not definitively demonstrate that they are associated specifically with happiness rather than approach tendencies, greetings, positive evaluations or other variables that are more or less correlated with the emotion in question. Similarly, young infants' differential patterns of apparently emotional response to different facial positions (e.g., Haviland & Lelwica, 1987; Izard et al., 1995) demonstrates discrimination (as well as recognition of self-relevance) at some level, but does not prove that these visual patterns are innately perceived as indicators of emotion as such.

Comparative Evidence

Regardless of the accepted problems in establishing homology across species (see Fridlund, 1994), there are serious difficulties in supporting emotion-expression links in non-human primates (e.g., van Hooff, 1972) and other species. Although other animals certainly make facial movements that bear comparison with human ones, sometimes in situations with plausible emotional effects, we cannot be sure that even homologous movements reflect emotions themselves rather than other associated factors. For example, threat displays may be seen as signs of anger but their more direct meaning is precisely as threats, communicating a social motive about impending aggression to a conspecific. Unless it could be demonstrated that such displays also accompanied other kinds of anger including non-social kinds, there can be no convincing demonstration of their emotional basis. Of course, part of this indeterminacy derives from overlap between conceptions of what counts as an emotion and what counts as a social motive. (I discuss this issue in a later section.)

Neurological Evidence

A final source of evidence for direct links between emotions and expressions is potentially available from neuropsychology. However, as yet no brain areas or circuits have been found that uniquely correspond to "basic" emotions. For example, none of the emotion-related regions identified in recent reviews of neuroimaging data (Murphy, Nimmo-Smith, & Lawrence, 2003; Phan, Wager, Taylor, & Liberzon, 2002) always lights up whenever the corresponding emotion is experienced, and each of them sometimes light up when it is not, making them unlikely candidates for direct substrates (see Barrett, 2005)..

The inability to localize function definitively means that investigators are in no position to track neural paths from emotions to facial musculature, and that any neurological evidence must necessarily be indirect. Indeed, without agreed psychological criteria for the occurrence of any given emotion, the status of any associated brain centre would have to remain in doubt in the first place (e.g., Panksepp, 2000). For example, if emotions are conceptualized as modes of action readiness (e.g., Arnold, 1960, Frijda, 1986) then it would seem practically impossible to demonstrate that they were controlled in the brain separately from behavioral intentions of certain kinds.

What does seem clear, however, is that the production and perception of facial patterns are partly localized, confirming at least some categorical basis for facial movement and its recognition (e.g., Etcoff & Magee, 1992; Fox & Davidson, 1988). Again, however, the issue is not whether the brain is attuned to facial patterns or that circuitry develops to generate corresponding motor patterns, but whether these patterns specifically relate to emotion. As yet, the jury is out concerning the question of whether different sites are involved in the recognition of “emotion expressions” as opposed to other muscular patterns (see Hasselmo, Rolls, & Baylis, 1989; Leonard, Rolls, Wilson, & Baylis, 1985; Posamentier & Abdi, 2003), but at any rate, to the extent that these putative expressions are coterminous with the displays of social motives discussed by Fridlund, the relevant data would still not distinguish between the competing views.

Perhaps the most suggestive evidence comes from the apparent dissociations in loss of facial control arising from lesions in different regions of the brain. For example, Rinn (1991) describes how patients with unilateral lesions in the cortical motor strip may be unable to raise one corner of their mouth on command but may show normal symmetrical smiles when exposed to something pleasant or amusing. Correspondingly, people with unilateral lesions in particular subcortical regions may be able to make facial movements when instructed but do not show the usual apparently automatic facial response on the affected side of the face when presented with a relevant trigger. Finally, patients with “pseudobulbar palsy” who have suffered damage to the pyramidal tract leading from the cortical motor strip to the facial nucleus in the pons, may be subject to bouts of apparent laughing or crying although they report no emotion. Rinn’s interpretation is that separate motor control systems underlie deliberate facial movement and the spontaneous expression of emotion. Further, the higher-level cortical system can exert specifically inhibitory effects on emotion expressions corresponding to the operation of display rules.

Fridlund (1994) argues that this is not the only possible reading of the neuropathological and neuroanatomical evidence. In particular, he points out that separate mechanisms for “deliberate” and “automatic” control also characterise muscular movements in parts of the body other than the face. Why then should we invoke emotion to explain facial movement but not other kinds of

muscular control? As for the phenomenon of pseudobulbar palsy, Fridlund questions whether an emotional expression is being released from inhibition during the symptomatic bouts of laughing or crying. Instead, he argues that the muscle-control pathways have become pathologically susceptible to stimulation. Indeed, if the impulse to laugh or cry derived from emotional activity, then it is hard to understand why no corresponding emotion is reported by patients undergoing these reactions.

There are two potential problems for Fridlund's account. First, even if nothing is special about the dual control systems for facial movements, they still imply a genuine distinction between controlled and automatic patterns. Fridlund's interpretation of the latter as overlearned habits deriving from prior deliberate movements may be viable in some cases, but ignores the possibility that some facial patterns emerge in ontogeny prior to their direct reinforcement as operants. Second, why deny cortical inhibition of facial movements, when such inhibition has been clearly demonstrated for the other facial movements that Fridlund argues are continuous with facial ones?

Summary

None of the available cross-cultural, developmental, comparative, or neurological evidence provides conclusive support for Ekman's claim that some facial movements are innately linked to emotions. The moderate correlations typically obtained between emotions and facial movements are also compatible with Fridlund's model (and several others, e.g., Russell, 1994). It therefore becomes necessary to look elsewhere to assess the relative viability of the competing accounts. Some of Fridlund's most distinctive predictions concern the sensitivity of facial movements to real and imagined addressees, and it is to these that I now turn.

Interpersonal Influences on Facial Movements

Emotion-expression and motive-communication theories make different predictions about the impact of the interpersonal context on facial movement. For Ekman, other people can invoke display rules that interfere with spontaneous emotion expression. For Fridlund, other people are the intended addressees of motive communication in the first place. Ekman's theory thus implies a potential conflict between two kinds of process controlling facial expression, one natural and automatic, the other socialized and deliberate. Fridlund, by contrast, proposes that any conflict arises between the requirements of different onlookers and addressees (cf. Fleming, 1994) rather than between internal and external pressures. Ekman's theory therefore predicts that the presence of an audience leads people either to inhibit or exaggerate emotion expression depending on relevant cultural norms. Most of the research into display rules specifically focuses on the potentially inhibitory effects of others on facial movement. Conversely, Fridlund's model suggests that the presence of others may sometimes facilitate facial movement but that it never leads to active inhibition (because there is no initial impulse to movement without a suitable addressee). In the following sections, I review evidence concerning the effects of other people on the inhibition

and facilitation of facial movement.

Audience Inhibition

Unlike Fridlund, Ekman does not believe that other people are necessarily implicated in the initiation of facial movements. Instead, the presence of others may invoke display rules encouraging modulation of expressive impulses that have already been activated. Thus, if two cultures share a common elicitor for the same basic emotion, their facial response to that emotion should differ only to the extent that they have different norms about expressing it. Few researchers have assessed whether the activation of display rules changes the relation between emotion and expression.

In Friesen's famous study (see, for example Ekman, 1972; Fridlund, 1994), Japanese and US students watched stress-inducing films alone and then again while being interviewed about them by a researcher. The resulting facial expressions were described as equivalent across the two "cultures" when the film was viewed alone, but Japanese participants showed fewer "negative" expressions and more "positive" ones in the interview situation.

Ekman (1972) concluded that the Japanese participants' unpleasant reactions to the films were masked in accordance with the societal norm that unpleasant emotions should not be expressed in the presence of authority figures. In this view, interpersonal factors activated a Japanese display rule that in turn influenced the expression, but not the emotion itself. However, other interpretations are possible. First, the only evidence that Japanese and US participants had similar reactions to the film in the alone condition derives from the comparable frequencies of positive and negative expressions, when more fine-grained analysis suggests cultural differences in specific facial movements (Fernández-Dols & Ruiz-Belda, 1997). Second, the interviewer's presence brings several consequences apart from its supposed effects on the motivation to conceal emotion. In particular, unlike American participants, Japanese participants may not have perceived the interviewer as a suitable addressee for communications about negative aspects of the film. Further, their displays may have been oriented to the interpersonal relations inherent in the situation rather than relating to the film itself (Fridlund, 1994). Indeed, Wagner and Lee (1999) note that the probability of facial movements that did not match the film's emotional content (mainly smiles) was increased by the interviewer's arrival across *both* cultures.

US participants like Japanese ones probably responded to the interpersonal context, but may instead have read it as requiring symbolic communication of the film's negative content to the interviewer (Fridlund, 1991a; 1994). Thus, neither group's facial movements need have been a direct response or counter-response to the content of the film. Instead, they may have reflected alternative perceptions of the interview situation, with Japanese students more attuned to its authority implications, and US students more attentive to the film and its emotional impact as the

topic of conversation. Any smiles that occurred may have been conversational rather than directly emotional.

A subsequent extended replication of Friesen's study by Matsumoto and Kupperbusch (2001) adds further complications. Here, participants scoring higher on collectivism (Hui, 1988) showed more negative faces while viewing pleasant movie clips in the presence of a professor than when viewing alone, but more positive faces when viewing unpleasant clips in the professor's presence. This pattern of findings suggests that any display rules in operation dampened the expression of pleasant as well as unpleasant feelings. However, facial conduct was also influenced by contextual factors even when participants were watching the clips alone. In particular, when they had been told that the experimenters wanted to ask them questions about the clips, solitary high-collectivists showed more negative faces in response to unpleasant material and more positive faces in response to pleasant material, apparently reversing the pattern later shown during the interviews. One possible interpretation is that these participants were displaying appropriate signals to an imagined addressee who was interested in their emotional reactions. Perhaps, then, people with more other-oriented values are simply better attuned to the differential requirements of interpersonal situations.

Unlike Friesen, Matsumoto and Kupperbusch (2001) also collected self-report data about emotional reactions. This allowed them to assess the correspondence between experience and expression more directly. Even though their facial displays were affected, it was found that high-collectivists did not report less intense emotional reactions to the clips after watching them in the presence of the professor. At first glance, this finding seems to support Ekman's notion that expression of emotion is being explicitly suppressed.

However, there are problems of interpretation here too. First, emotion was reported retrospectively, whereas facial movements were recorded while the film clips were still showing (cf. Rosenberg & Ekman, 1994). As argued above, facial communications directed at the professor may not always have been about the film clips in the first place and would not therefore be expected to reflect the overall emotional impression produced by these clips. Further, like facial communications, self-reports of emotion may also be closely attuned to the perceived interpersonal context (cf. Hess, Banse, & Kappas, 1995, p. 280), especially for people with collectivistic values. It is possible, therefore, that these participants' reports of emotion reflected the perceived demands of an enquiry about their specific reactions to the films rather than their general emotional state relating to the situation more generally (including the social interaction). Matsumoto and Kupperbusch (2001) also took measures of autonomic activity, which may be less susceptible to presentational concerns. Unfortunately, however, the published article includes no report of their analysis.

Another possible instance of audience inhibition was provided in a study by Kraut (1982). Participants were exposed to a variety of pleasant and unpleasant odors either alone or in the presence of another participant. At phase 1, unmanipulated facial reactions to the odors were recorded, and at phase 2, participants attempted to disguise the nature of the presented smell by posing a contrasting expression. Subsequently, independent raters viewed the videotaped facial responses of the first set of participants from both conditions. Judgement accuracy was operationalised in terms of correlations between raters' estimates of senders' affective reactions and senders' self-reports of these reactions across both pleasant and unpleasant odors. Kraut found that there were marginally significant differences in the effects of other-presence in the unmanipulated and disguised conditions. When another participant was present, faces were less revealing of odor pleasantness in the "spontaneous" condition, but more revealing of odor pleasantness in the "manipulated" condition. Apparently, the presence of another person not only prevented participants from showing their affective reactions in the spontaneous condition, but also prevented them from successfully masking affect in the manipulated condition. This pattern of findings is difficult to explain from a motive-communication perspective because it is unclear why the same audience should invoke apparently contradictory social pressures across the two conditions.

Fridlund (1994) argued that Kraut's participants already had a salient audience across both social presence conditions because they knew that they were being videotaped. However, the camera was ostensibly still switched off when the reported data were collected. On the other hand, the fact that the study was presented as an examination of the ability to cover up spontaneous facial expressions does make it extremely likely that participants knew that they were supposed to produce facial expressions for the experimenter's benefit in phase 1. It may be that the other participant's presence partly distracted them from conforming to this experimental demand. Similarly, distraction may have interfered with the task of showing opposing facial movements in phase 2.

But why then should information about slide pleasantness "leak out" through the manipulated movements in phase 2? Unless the smells' affective qualities produced spontaneous impulses to expression, it is hard to see what social motives or audience orientation might explain this finding. Fridlund's response is that readable facial responses to some potent unpleasant odors reflect reflexes rather than displays and are therefore outside the range of the motive-communication account (e.g., Tassinari, 1985, cited in Fridlund, 1994). For example, the stench of ammonia leads to oropharyngeal irritation and visible reflexive movements to clear the mouth and throat. Whether such primitive approach or avoidance movements have affective content is a controversial issue (e.g., Steiner, 1979; Zajonc, 1984).

In Kraut's study, a translucent screen separated co-participants making them unable to pick

up one another's facial signals. Other studies have usually found that the less constrained presence of another person leads to more readable facial responses to tastes and odors (e.g., Brightman, Segal, Werther, & Steiner, 1975; 1977; Gilbert, Fridlund, & Sabini, 1985; Jäncke & Kaufmann, 1994, but see Soussignan & Schaal, 1996, discussed below).

In summary, audience inhibition studies fail to provide unambiguous evidence that facial expressions specifically arising from emotions are suppressed in accordance with display rules. Although interpersonal and cultural factors clearly make a difference to facial conduct, the precise mediation of these effects remains uncertain. Further, although there are strong intuitive grounds for acknowledging occasional conflicts between controlled and automatic processes in shaping facial movements, it has not been conclusively demonstrated that the former reflect conformance to display rules and the latter spontaneous expression of basic emotion. Future research needs to incorporate on-line measurement of both emotions and social motives in order to explore their relative contributions (cf. Jakobs, Manstead, & Fischer, 1999a). In addition, more attention should be paid to the other-orientation of participants. For example, is their facial conduct specifically attuned in real-time to the dynamic facial conduct of the audience, or does it depend more on the simple knowledge that someone is observing? Studies that independently manipulate observation by others and presence of others may help to disambiguate the findings (e.g., Jakobs et al., 1999a).

Ekman's theory may impose undue restrictions on the possible roles of social factors in the determination of both emotion and facial movement. Even in his own terms, the effects of cultural context on situational appraisal and the consequent changes in emotion make it practically impossible to isolate any pure effect of display rules. Can any manipulation that modifies the interpersonal context sufficiently to effect a change in the perceived requirements for communication avoid simultaneously influencing the emotional nature of the setting itself? As Fridlund (1991a, p. 72) argues: "The display rules concept is inherently problematic, because it is predicated upon the dubious premise that one's emotional state in public could be equivalent to one's state in private."

To take this further, the ongoing responsiveness of another person shapes the conduct of both emotion and facial movement in real time more directly than Ekman's account implies. Interpersonal processes not only activate display rules and shape the nature of the emotional situation, but also have a more direct impact on facial movement even when no emotion is being suppressed or exaggerated. For example, the other person's facial conduct may prompt mimicry, synchronization, contagion (Hatfield, Cacioppo, & Rapson, 1994), or countermimicry if the situation is perceived as competitive rather than co-operative (Lanzetta & Englis, 1989). Relatedly, people may use other people's observed expressions in order to calibrate their own appraisal of the situation (Manstead & Fischer, 2001; Sorce, Emde, Campos & Klinnert, 1985). Disentangling

these various effects from the potential impact of display rules requires closer examination of the time course of emotional and facial responses, and tighter predictions about, and manipulations of, the salience of specific cultural norms concerning expression.

Despite the apparent limitations of Ekman's account of audience inhibition, it does contain intuitively plausible features. Indeed, it would strain credulity to reject the idea of display rules outright. Even if their operation does not exhaust the impact of the social context on expression, and even if not all emotions lead to specific expression impulses requiring regulation, people do sometimes deliberately modulate what shows on their own faces in accordance with perceived norms (Frijda, 1995). Some of the meanings they seek to disguise may well be emotional ones. For example, the urge to laugh is often consciously suppressed in sober settings, and we sometimes attempt to appear less distressed than we feel by holding back tears. However, the spontaneous impulses that are regulated in both cases do not necessarily arise directly and inevitably from biologically basic emotions whose essence is unaltered by the social context.

In Fridlund's view, social convention does not lead to the suppression of authentic emotion expressions. Instead, conflicting facial control processes are at an equivalent level, both reflecting social motives. On the one hand, we want to communicate an intention to someone else, on the other hand and for other reasons, we do not want to communicate it (or there are two conflicting intentions, both of which we want to communicate). However, this provides no direct explanation of the phenomenal experience that the first impulse (to express something) is at a more basic level (taking *control precedence* in Frijda's terms, 1986). Our sense is often that the expressive impulse comes from deep within, whereas expressive control is imposed upon this impulse from elsewhere. Of course, this subjective perception may represent a form of false consciousness arising from our implicit socialization into romantic ideologies. Alternatively, the felt priority of one impulse may simply reflect its earlier origins in infancy when desires were unregulated². A third possibility is that our deeply felt urges may reflect closer identification with the relevant identity positions or roles rather than any natural origins (Parkinson, 1995; cf. Sarbin, 1986). However, any such implication that one set of motives come from a more personally felt place takes us closer to an acknowledgement that these motives are more emotional. Any distinction between motives based on their priority or proximity to the self implies a two-factor analysis (not unlike Ekman's) where expressive urges are controlled by culturally determined regulation strategies.

Audience Facilitation

Whereas Ekman's theory suggests that other people may invoke display rules that moderate spontaneous expression of emotion, Fridlund argues that there needs to be an appropriate addressee in order for the display to be transmitted in the first place. According to the emotion-expression view then, there should be less inhibition of spontaneous emotional expression in unobserved than

in observed situations. By contrast, the motive-communication prediction is that there will be less facial movement in unobserved situations than in situations where an amenable addressee is present (or otherwise cognitively available). These apparent differences in prediction are partly mitigated, however, by the rarely investigated possibility of facilitatory display rules which may exaggerate an emotion's presentation.

Audience facilitation in adults. Evidence that facial movement depends on the availability of suitable addressees comes from a variety of sources. Perhaps the most famous research was conducted by Kraut and Johnston (1979). In their second and most persuasive study, observers recorded smiles during games of ten-pin bowling. One observer took a concealed position behind the skittles and could therefore record smiles that occurred in response to a pleasant emotional event that was non-social (no-one else could see the bowler's face when the pins fell). A second observer watched the bowler from behind the bowling pit, and was thus able to record any smiling that was specifically directed to fellow bowlers. Results were clear-cut. While facing the pins, smiling occurred on fewer than 5% of occasions even when bowlers had scored a strike or spare. However, smiling was much more common when bowlers turned to face their friends even when only a few skittles had fallen. Thus, smiling seems to depend more on the presence of an addressee than on emotional state.

However, the authors provide little evidence that bowlers experienced more than mild affective responses to success or failure in the game. Indeed, one unconsidered factor that may have influenced their emotional reactions was their skill-based expectation of probable score. A strike may induce substantially more pleasure in a bowler who is unfamiliar with such an outcome than in one who routinely achieves the highest possible score. This observation partly undermines the comparison between smiling after "good" and "bad" scores, because we do not know to what extent these scores were good or bad for the bowlers concerned. Indeed, it seems likely that the highest-scoring bowlers were the more skilful ones, who would be consequently less elated about success. However, a subsequent replication by Ruiz-Belda, Fernández-Dols, Carrera, and Barchard (2003) showed that restricting comparisons to occasions when bowlers explicitly reported happiness did not substantially alter the effect. Unfortunately, this later study did not rule out increased happiness while engaging with friends following a successful bowl (Frijda, 1995; Jones & Raag, 1989). Happiness may have only become sufficiently intense to produce smiling after bowlers' registered their competitors' reactions.

A second interpretational issue concerns the fact that observers were not instructed to distinguish between Duchenne and non-Duchenne smiles. According to Ekman, only the former are signs of genuine happiness. Indeed, Ekman (1979; 1989) explicitly suggests that other kinds of smile may be used as conversational signals or "referential expressions" regardless of current

emotional state. If bowlers did not feel extremely happy when the pins fell and had no-one to be polite towards, Ekman would predict neither polite nor conversational smiles. However, after turning to face their friends, conversational smiles but not Duchenne smiles would be more likely. Further, bowlers may have conformed to a facilitatory display rule encouraging positive expressions toward this particular audience. Fortunately, Ruiz-Belda and colleagues' (2003) study helps to assess the viability of this alternative interpretation. They found that Duchenne smiles, like non-Duchenne smiles were more common in social than non-social phases of the game, effectively ruling out any interpretation of the socially directed smiles as simply conversational using Ekman's own criteria for their identification. However, if it is assumed that engaging with other players intensifies happiness, these findings are still not entirely inconsistent with Ekman's theory.

A final issue arises from the general problem (noted above) that audiences are not usually passive recipients of messages from senders but typically also function as social actors in their own right. As a consequence, their own facial and emotional behaviour is likely to affect the participants whose responses are being recorded. In particular, if the other bowlers tend to smile when the participant turns to face them, then this behaviour rather than their simple presence may be what induced the smiling. Because Kraut and Johnston made no systematic observations of co-bowlers' facial conduct, we cannot rule out mimicry (e.g., Hatfield, Cacioppo, & Rapson, 1994) or politeness in returning smiles. However suggestive its findings, Kraut and Johnston's study 2 taken alone cannot therefore be treated as a definitive refutation of Ekman's theory. (Studies 1 and 3 are no more conclusive).

In Kraut and Johnston's studies, emotional involvement may have been too low to induce frequent spontaneous expressions of happiness. Indeed, laboratory studies face inevitable practical (as well as ethical) problems in stage-managing powerful emotional incidents, and most observational studies have focused on occurrences that are easily repeatable and hence unlikely to activate strong emotion. Fernández-Dols and Ruiz-Belda (1995) corrected this limitation by examining facial conduct at moments when people were undergoing some of the most intensely positive experiences of their lives. Their study analyzed close-up footage of faces from TV coverage of the 1992 Olympic games.

Comparisons were made between gold medallists' facial movements during three phases of awards ceremonies. At stage 1, medallists waited behind the podium while the organizers took their positions, and engaged in little face-to-face interaction. At stage 2, athletes stood on the podium to receive their awards, conversed with the authorities, and were highly visible to the public. At stage 3, the winners' National Anthem was played while they faced their country's flag. Again, there was little or no interpersonal interaction, and although the medallists were clearly visible to the public, their attention was focused elsewhere.

If smiling depends purely on happiness, it should occur throughout these three stages, since the athlete's world-beating victory was still a very recent event. Indeed, an independent group of medallists rated levels of happiness at more than 9 on a 10-point scale and all negative emotions at less than 1 for all three stages of the ceremony. However, Duchenne smiling occurred extremely rarely (less than 5% of the time) except during Stage 2 when competitors were actively interacting with others. Non-Duchenne smiling was slightly more common during stages 1 and 2, but still at less than 10%.

These findings imply that the presence of an amenable addressee encourages smiling. This effect is difficult to explain in terms of a facilitatory display rule because the extent of happiness should already be sufficient to induce smiling without further encouragement. Further, Duchenne smiles are considered to be spontaneous expressions of happiness that should be immune to deliberate exaggeration (Ekman, 2001). Thus, a second conclusion is that intense happiness is not a sufficient condition for the occurrence of the facial movement often considered to be its natural expression.

The results from stage 3 of this study present fewer problems for Ekman's theory. Here, smiles might have been suppressed in accordance with the display rule encouraging sombre respect for flags and national anthems. However, the lack of smiling in stage 1 is difficult to explain in terms of display rules because the victorious competitors were essentially unobserved during this period (except by the ever-present TV cameras). Further, the most salient audiences for any display would likely condone rather than disapprove of smiling, anyway (with the possible exception of the other potentially disappointed athletes who had competed in the same event). It might be argued, however, that competitors were mentally preparing themselves for the ceremony and may even have experienced nervous feelings about facing the crowd. Although it is hard to imagine this anxiety over-riding their happiness, it seems conceivable that the muscular correlates of intense concentration overwhelmed any underlying smile (Frijda, 1995).

Another potential issue relates to the flexibility of the term "happiness," which may refer to a mood, a state of subjective well-being, or a variety of pleasant emotional states. Indeed, Ekman (2003) explicitly distinguishes sixteen different kinds of enjoyment. Although he claims that Duchenne smiles are the characteristic natural expression of each of these pleasant states (p. 204), in fact smiling might only be a direct consequence of certain forms of happiness. Indeed, he implies elsewhere that different expressions may represent different members of the same emotion family (Ekman, 2001). To avoid circularity, it would also be necessary to specify intrinsic features of a particular happy state that independently predict its dissociation from smiling. One candidate for such a dissociable state, however, might be a triumphal feeling coming as a release after a period of intense struggle (perhaps indicating a victorious emotion that Italians call "fiero," Ekman,

2003). However, Fernández-Dols and Ruiz-Belda (1995; 1997) report no consistent facial expression of any kind in stages 1 or 3, and the variety of recorded movements argues against any unified counter-explanation. Even if another fiero-related movement had been identified, it would still be necessary to rule out the interpretation that it reflected interactional demands rather than emotion (Fridlund, 1994).

A final possibility is that smiling occurs only at moderate and not at intense levels of happiness. For example, many authors have acknowledged that being overcome by happiness may lead to tears rather than brightened eyes (e.g., Ekman, 2003; Fernández-Dols, 1995; Frijda, 1986). Further, Ekman (1997) argues that crying among winners may be a spillover from the anticipated distress of losing whose expression no longer needs to be suppressed now that victory is certain. Along similar lines, extremely good news of this kind may often take a while to “sink in” especially when you are physically exhausted following extreme exertion. For this reason, athletes may still have been coming to terms with their victory at stage 1, before the direct congratulation from others made its positive implications more definite and concrete. Finally, Rosenberg and Ekman (1994) make the point that a closer correspondence between facial movement and emotion is obtained when variations over time are explicitly assessed (see also Ruch, 1995). It is possible that encounters subsequently interpreted as consistently happy in fact contain only occasional bursts of pleasant affect, each of which induces an associated burst of Duchenne smiling. These bursts might even be specifically associated with social contact.

However plausible some of these alternative interpretations in terms of emotional variability, quantity, or quality might seem, all require post hoc adjustments to the emotion-expression view made specifically to increase its fit with the data. Even if some version of the theory could be salvaged, it would not be precisely the one originally proposed by Ekman. Regardless of interpretation, Fernández-Dols and Ruiz-Belda’s findings undermine any direct link between all kinds and degrees of happiness with smiling. “Happiness” alone does not consistently lead to smiling although happiness along with a suitable affiliative audience frequently does. Conversely, the results of this and other studies show that the Duchenne smile does not simply mean happiness, but corresponds instead to more precisely defined situations such as affiliative encounters (Owren & Bachorowski, 2001).

Audience facilitation in infants and young children. Jones and colleagues (Jones, Collins, & Hong, 1991; Jones & Raag, 1989) used a methodology analogous to that developed by Kraut and Johnston in three studies using infants rather than adults as participants. The potential addressee for communicative signals was the child’s mother and the non-social emotional objects were a set of attractive toys. Mothers sat at the opposite end of the room from the toys so that the infants had to turn away from their playing in order to interact. Mothers were instructed to be attentive to their

children for half of the procedure but to devote their attention to a book or magazine for the other half.

Substantially more smiles were directed towards mothers than toys when mothers were attentive, whereas smiling was equally directed at toys and mothers when mothers sat reading and paying little attention to the infant. In Jones and Raag's study 2, an attentive stranger also sat in the room. Under these conditions, smiles tended to be directed more to this stranger when the mother was inattentive. The investigators argued that this last finding confirmed that the mother's inattention did not reduce smiling because of its negative emotional effects, but rather because it removed a potential addressee. When an alternative audience was provided, smiles were directed towards that person instead. However, it is also possible that the presence of a receptive stranger compensated for any negative emotional effects of an absence of maternal attention.

Another reason for believing that caregiver attention exerted social rather than emotional effects is that smiling towards toys was at equivalent levels across both maternal attention conditions. If other-attention made children generally happier, they should have smiled more regardless of where they were facing. However, this finding is equally problematic for the claim that smiling while facing the toys reflects communication directed to an imagined audience. If the most salient addressee is currently unreceptive, then this should also reduce smiling more generally according to the motive-communication account. In fact, the finding that some smiling was directed at toys even when no obvious addressee was available implies an emotional as well as a social influence. Further, smiles oriented at mothers usually started before infants turned to face them, suggesting that they were responses to the toys rather than to the mother's overtures. As in Kraut and Johnston's study, Jones and colleagues also failed to distinguish between Duchenne and non-Duchenne smiles, leaving open the possibility that emotional smiles were directed at the toys and conversational smiles were directed at mothers (and receptive strangers).

Jones et al. (1991) argued that their 10-month-old participants were unlikely to be sensitive to explicit socialized display rules about facial conduct, and conclude that smiling is a social signal even at an early age, rather than starting out as an emotional symptom that only becomes subject to social control during enculturation. Nevertheless, these infants might have already learnt about the interpersonal consequences of their nonverbal conduct at a more implicit level. For example, they may have come to anticipate rewarding interactions whenever they directed their smiles at a receptive caregiver, leading to exaggeration of any affective signal under these conditions.

Schneider and Josephs (1991) observed smiles following success and failure in a "frog-snapping" game played by preschool children. In study 1, smiles, including Duchenne smiles were more common after failure than success, undermining the view that they are direct expressions of happiness. Further, smiles following failure were associated with looks directed at the experimenter

more often than smiles following success, confirming their communicative function. Study 2 showed that Duchenne and non-Duchenne smiles occurred more often when the game was played with the experimenter than alone regardless of whether the outcome was positive or negative. The absence of smiles following success in non-social trials is hard to explain in terms of display rules because the children were unobserved. However, the intensity of happiness produced by success in this game may have been insufficient to produce true smiles. If so, there would still be the problem of explaining the Duchenne smiles. Indeed, the fact that Duchenne smiles are observed even when participants do not seem to be happy (e.g., Schneider & Josephs, 1991) again confirms that this emotion is not a necessary condition for its supposedly diagnostic expression.

Facilitation by imagined audiences. Fridlund (1991b) advanced the study of interpersonal effects on smiling into the territory of the imagination. His experiment was designed to test the seemingly unfalsifiable assumption that private smiles are directed at intrapsychic audiences (see above) by invoking the concept of “implicit sociality” (Fridlund, 1991b). The procedure involved showing a series of pleasant movie clips (including an extended segment from *Saturday Night Live*) to participants while friends were more or less imaginatively or physically present. EMG readings from the zygomatic major were greatest when participants watched the movie segments with a friend in the same room. Further, for participants watching the clips alone, zygomatic activity was greater when they believed that a friend was in another room (either performing an irrelevant task or watching the same clips) than when they had arrived at the laboratory without a friend. There was also a near-significant difference in zygomatic activity suggesting that imagining a friend watching the same film at the same time produced more smiling than imagining a friend doing something different. Fridlund’s explanation is that we direct private displays at imagined others, and those others are more available in imagination when they are sharing a similar experience.

One problem of interpretation arises from Fridlund’s own criticism of display rules studies, that it is difficult to manipulate social context without also affecting emotion (see above). Similarly, we might plausibly argue (as did many of Fridlund’s participants in a follow-up Gedanken experiment) that the imagined or physical presence of a co-viewer enhances our enjoyment of pleasant movies (see also Fridlund, Kenworthy, & Jaffey, 1992, and below). Any differences in smiling might therefore reflect greater enjoyment of the clips rather than direct effects of implicit or explicit sociality.

Fridlund rejected this interpretation using participants’ retrospective self-reports of emotions experienced while watching the films. These revealed no overall differences between conditions and did not covary with zygomatic activity. However, it is not clear that ratings of recalled general affect are sufficiently sensitive to capture the moment-by-moment variations in happiness that may have influenced smiles while participants watched the clips (see Fridlund’s footnote 3, p. 232).

Indeed, if self-reports and facial movements are treated as equally other-oriented, they should be subject to parallel effects of sociality (cf. Hess et al., 1995, and see above). From this angle, a possible reason for dissociation is that emotion ratings were addressed to the experimenter (who was apparently interested in the emotional effects of the clips themselves) whereas smiles were addressed at friends who might potentially share the viewer's enjoyment.

The films presented by Fridlund also differed along the sociality dimension. Two clips showed "cute babies" playing, in one case with a rattle (inanimate object), in the other case with another person (peek-a-boo). Two other clips showed animals playing, in the first case dogs (familiar domesticated animals), and in the second sea otters (unfamiliar wild animals). However, Fridlund does not report zygomatic data arising from this implicit comparison, despite his interpretation of earlier effects of stimulus sociality (Ekman, Friesen, & Ancoli, 1980) in terms of motive communication (p. 232, footnote 3; Fridlund, 1994). Participants in Ekman et al.'s (1980) study smiled while watching films of animals playing, but hardly at all while watching a non-social ocean sequence.

A final issue arises from the lack of EMG data from the orbicularis oculi. It therefore seems possible that any recorded smiles were conversational rather than emotional. Although the idea that conversational signals may sometimes be delivered in situations that are only implicitly social is not considered by Ekman and colleagues, it is not unduly implausible. However, this criticism does not apply to a subsequent replication by Hess et al. (1995), who found increased orbicularis oculi activity in conditions of higher sociality, when friends were implicit or actual co-viewers.

Moderators of Audience Effects

Perhaps unsurprisingly, the findings reviewed above demonstrate that the real or imagined presence of other people sometimes reduces and sometimes increases facial movement. Evidence of movement reduction does not conclusively rule out motive communication, but some evidence showing movement amplification is difficult to accommodate within an unreconstructed emotion-expression account. However, neither theory makes consistent predictions about audience effects on facial movements that apply across all conceivable situations. To provide more conclusive relative evaluations, it is therefore necessary to consider *when* rather than *whether* other people increase or reduce facial movements. In the following sections, then, I set out some of the general factors that might moderate the impact of the interpersonal context on facial movement and consider whether the impact of these moderators is more consistent with processes postulated by Ekman's or Fridlund's model.

Displayees' roles. One of Fridlund's most distinctive assertions is that facial displays are always other-directed. In his view, people do not just display, they display to specific addressees, even if these addressees are imagined or internalized. For example, our smiles convey our

willingness to co-operate with someone, and we smile at this someone in particular rather than just giving off smiles willy-nilly. Even if the generality of this sociality principle is debatable, it has inspired a great deal of valuable research demonstrating various interpersonal effects on emotion. However, without some articulation of the particular influences of different kinds of addressees for facial displays, it can only offer loose guidelines for interpretation rather than specific explanations and predictions (cf. Hess et al., 1995). In this regard, the concept of “audiences” for facial displays has proved somewhat restrictive, since it tends to confuse several different possible influences of others on facial conduct. For example, someone may serve as a target for a facial action (e.g., when aggressive faces serve as threats), or they may be less directly involved but still be present to witness what happens (onlookers, see Fridlund, 1994, pp. 145-146, for a parallel distinction between “referents” and “referees”). In either case, facial movements may be influenced.

To complicate matters still further, the direct *addressee* for a facial communication need not be the same person that the communication is about (e.g., Stoppard & Gunn Gruchy, 1993; Timmers, Fischer, & Manstead, 1998, *inter alia*). For example, people may display aggressive intentions to someone other than the person against whom their aggression is directed (the target). Additionally, targets, addressees, and onlookers are typically also engaging simultaneously in facial conduct themselves, bringing their own influence on the ongoing episodes. Finally, existing relations, respective roles and social identity positions may make a difference to how each party to an interaction acts and reacts.

Few of these complexities have been directly addressed in research. Indeed, the audience-effect studies reviewed above mostly operationalised sociality as a unidimensional factor relating to degree of other-presence (e.g., Fridlund, 1991b; Kraut & Johnston, 1979), assessing whether manipulations of this factor lead to corresponding effects on facial movement as if context made no difference to its operation. However, evidence is now growing that the extent and nature of other people’s influence partly depends on who they are.

In a partial replication of Fridlund’s implicit sociality study, Hess et al. (1995) varied participants’ relationships with their actual or implicit co-viewers. Participants either arrived at the laboratory with someone they knew who also watched the films or performed a different task, or arrived alone and met the other participant for the first time in the laboratory. As in earlier studies (Buck, Losow, Murphy, & Costanzo, 1988; Wagner & Smith, 1991, reviewed below), the co-viewer’s status as friend or stranger affected facial conduct. In particular, the presence of a friend but not a stranger facilitated orbicularis oculi and zygomatic major activity.

Although Hess et al. present these findings as a disconfirmation of Fridlund’s predictions, nothing in the differential effects of friends and strangers is incompatible with the other-directedness of displays. Fridlund has certainly never claimed that displays are *indiscriminate*

concerning to the nature of their addressee (see also Russell et al., 2003). In fact, his position seems to be that displays are flexibly deployed to suit the particular interpersonal demands of the current situation, and these demands would be different for different kinds of relationship. Further, the social motives underlying displays are likely to be different when with friends and strangers. Affiliation, for example, takes a very different form in the two cases. As Chovil and Fridlund (1991, p. 163) argue: “Facial displays are a means by which we communicate with others. Like words and utterances, they are more likely to be emitted when there is a potential recipient, when they are useful in conveying the particular information, and when that information is pertinent or appropriate to the social interaction.”

Not only the closeness of relationships but also the specific nature of the role positions occupied by parties to an exchange may moderate the impact of audiences. For example, Hecht and LaFrance (1998) explored the effects of power and gender on smiling in interpersonal situations. Their basic idea was that women as well as people with relatively less influence may feel obligated to smile rather than simply smiling because they are happy (see also Timmers, Fischer, & Manstead, 1998). Participants assigned the role of an interviewer in a simulated job-selection procedure did not smile any more than interviewees, but their smiling was more closely associated with self-reported positive affect. By contrast, smiling by the interviewees, who had relatively less power in this situation, was more closely associated with their desire to please the other person (a more explicit social motive). This latter association applied even to Duchenne smiles.

Gender also influenced both Duchenne and non-Duchenne smiling, but only in informal conversations that implied no power differential. Whenever one interactant took on the higher-power interviewer role, power effects over-rode gender effects. These findings reinforce the point that it is not simply another person's presence that makes a difference, but also their degree of influence and gender. Clearly, smiles are not just switched on in direct response to the appearance of another human being. Instead, they take into account our specific relationship to that other person. Further research needs to establish whether these effects depend on the other's ongoing responsiveness as conditioned by their social identity (receiver factors) or on the sender's representation of the other as a member of a certain social category. For example, comparing conditions with different levels of direct interpersonal feedback may help to clarify interpretations.

A central problems facing research inspired by the motive-communication approach arises from its implicitly restrictive view of how the interpersonal context influences facial conduct. The notion of an “audience effect” implies that other people are there to receive information carried by facial display, rather than to play their own active part in ongoing action and communication. Although Fridlund sees sensitivity to signals as co-evolving with display, research has mainly focused on the other's role as a perceiver rather than someone who also sends information back.

Relatedly, Fridlund's theory may acknowledge the other-orientation of facial movements but studies have not yet addressed the variety of pragmatic functions that they serve. "Signalling" is often read as implying transmission of semantic meaning rather than exertion of pragmatic effects (cf. Austin, 1962), and faces are seen as telling the addressee something about the sender rather than as directly influencing their interpersonal target (blaming, persuading, asking for help etc). The focus on displays that tell receivers how the sender is about to act fails to do full justice to their flexible pragmatic deployment in real-time dialogue with others.

In sum, although there is little doubt that the motive-communication perspective can accommodate differential effects of varying audiences, precise predictions about these findings are not directly specified. The theory needs to develop an account of how different kinds of relationship influence the interpersonal directedness of displays, taking into account how these relationships are distributed among addressees, targets, and onlookers. In short, the motive-communication approach should be supplemented with a more articulated theory of interpersonal relations (e.g., Kemper, 2000), that also considers the ongoing dynamics of facial interchanges between the various parties.

Message content. The vast majority of audience facilitation studies have focused on smiling, partly because smiles are so common and apparently easy to induce, but perhaps also partly because interpersonal situations in which smiling is discouraged are relatively rare in contemporary Western society. The possibility that smiling has a special status because of its conversational role was raised explicitly by Rinn (1991, see also Etcoff, 1986), who found that people born blind find it difficult to pose facial expressions apart from smiles (see also Galati, Scherer, & Ricci-Bitti, 1997). Further, according to Ekman (e.g., 1998) smiling can be explained using Darwin's principle of antithesis and may derive its morphological characteristics from its communicative distinctiveness (e.g., Ekman & Hager, 1979). In short, if smiles were specifically shaped by signalling rather than practical pressures, then they may be more attuned to interpersonal factors than other more directly functional facial actions. How well, then, do audience effects generalize to facial movements apart from smiles?

Bavelas et al. (1986) staged an incident in which an experimenter dropped a television monitor onto his already bandaged finger in front of the participant. In one condition, he was facing the participant at the time; in the other, he turned from side-on to face someone else. Participants winced more often when the experimenter was facing them. Any winces observed in the side-on condition soon dissipated when no eye contact was forthcoming. It seems therefore that participants winced to demonstrate sympathy to the experimenter rather than because of any empathic emotional reaction to his pain. Similarly, Chovil (1991) found that the facial conduct of participants listening to stories about "close calls" (when a serious unpleasant event was only just

averted) contained significantly more empathic displays when the stories were delivered face-to-face than in other less directly interactional situations.

Although these findings convincingly demonstrate that facial movements apart from smiling are oriented to interpersonal rather than emotional considerations, it is not clear that Ekman's theory would have made different predictions from Fridlund's in either case. Despite the emotional connotations of the nonverbal signals deployed here, Ekman might justifiably interpret them as conversational gestures (emblems or illustrators) or referential expressions that are at least partly independent of expressions (e.g., Ekman, 1979). Any genuine empathic distress generated in both studies may not have been strong enough to produce instinctive facial responses. For this reason, neither study specifically supports Fridlund's motive-communication theory rather than a more general and less controversial model of the interpersonal orientation of some (but not necessarily all) nonverbal signals.

Wagner and Smith (1991) assessed facial movements in response to slides with various emotional qualities when the two co-viewers were either friends or strangers. For both pleasant and unpleasant slides, displays with friends provided more information about the slides' affective qualities than displays with strangers (as in Hess et al., 1995), suggesting that valence made no difference to the effects of sociality. However, Buck et al. (1992) found that watching with friends rather than strangers *increased* the clarity of facially conveyed pleasantness for sexual slides, but *decreased* its clarity for unpleasant and unusual slides. The authors concluded that spontaneous expressive responses to slide content can be either facilitated or inhibited depending on the relationship between sender with co-viewer.

Buck et al. contend that these findings conflict with Fridlund's theory. In fact, the motive-communication prediction would be that facial movements should be greater only when the messages they convey is specifically appropriate to the addressee. Message appropriateness is a function of both the recipient's identity (e.g., as friend or stranger, male or female, superior or subordinate) and message content. In particular, knowledge of how a friend might react makes some kinds of message appropriate and others less so. Furthermore, social motives may be quite different when different emotional stimuli are presented. For example, we may seek to calibrate our respective positions towards unusual or unpleasant objects with strangers whereas friends' attitudes are often already clear to us. The specific manifestation of any of these effects would, according to Fridlund, be acutely sensitive to context, making it hard to derive general predictions based only on information about the addressee and the nature of the emotional stimulus.

Fridlund et al. (1992) used a directed imagery procedure to generate anger, fear, happiness, and sadness under conditions of low or high sociality. For example, a situation imagined in the low sociality, sadness condition was going to bed feeling lonely, and a situation imagined in the high

sociality, fear condition was being accused of cheating by a professor in the middle of class. Fridlund et al. found no reliable correlations between self-reported emotion and EMG activity. Further, even after matching for emotional ratings, sociality influenced facial EMG significantly for all four emotion categories. However, there were differences in the direction of the effects across emotions. While facial movement increased in imagined high-social occasions for happiness, sadness, and fear, EMG activity was lower for high-social anger than for low-social anger. The authors explained this latter finding by speculating that people scowl at themselves as audience when experiencing anger alone, but do not always display antagonism towards people in social situations. Whether this account is substantively different from a display rules interpretation is debatable. Another possible explanation is that angry situations are often inherently social in the first place because anger tends to involve blaming someone else (e.g., Lazarus, 1991).

Soussignan and Schaal's (1996) study showed that the presence of an unfamiliar adult who maintained a neutral expression reduced children's facial responses to unpleasant odors but increased facial responses to pleasant odors – a pattern of results that seems to correspond to Buck et al.'s findings in the co-present stranger condition. Close analysis suggested that these odor-induced responses were too flexible and variable to be simple reflexes, ruling out one of Fridlund's potential counter-explanations (see above). However, movements may have been socially oriented even in the alone condition, because children were working under the experimenter's instruction to provide him with an evaluative rating for each smell (and had practiced this rating task in front of the experimenter before being left alone). Further, the co-present adult may have elicited appeasement motives because of her impassivity, leading to more smiles and fewer "disgust" faces. No data were provided concerning the impact of social presence on the odors' hedonic ratings, leaving open the possibility that they produced different emotional reactions or social motives across sociality conditions.

Jakobs, Manstead, and Fischer (2001) found that facial displays while watching sad films were influenced by the implicit sociality of the setting, with significantly more smiles and a non-significant tendency for more "sadness" displays when a friend rather than a stranger viewed the same film in a separate room. Other findings seem more consistent with the impact of display rules. In particular, "sad" faces were more common in the alone condition when sociality was apparently at a minimum. One possible conclusion, therefore, would be that faces may express emotions on some occasions and communicate social motives on other occasions (Rodriguez-Mosquera, Manstead, & Fischer, 2000).

However, as the authors acknowledge, the findings for sadness might be explained by solitary viewers imagining an idealised audience to whom they can address appeals for comfort during the presentation of upsetting material. Alternatively, identification with the movie characters

and immersion in the imagined interpersonal interactions depicted in the clip may have been easier without the distracting presence of another person. Because the film segment (from *Kramer vs. Kramer*) elicited compassionate rather than specifically sad responses, this increased level of involvement may have increased empathic displays towards the movie's protagonists. Indeed, the fact that frequency of "sad" faces was no more strongly correlated with sadness than happiness self-reports tends to undermine an interpretation purely in terms of emotion expression.

Zaalberg, Manstead, and Fischer (2004) made another attempt to assess potential separate effects of display rules and social motives. In their study, accomplices of the experimenters told jokes designed to be funny or unfunny to participants and assessed their social motives, conformity to display rules, and facial movements. Funny jokes tended to induce more Duchenne smiling (though the effect was not quite significant) and were associated with the desire to share pleasant feelings. Participants who experienced unpleasant emotions in response to jokes (e.g., embarrassment) showed more non-Duchenne, or "polite" smiles, and reported "prosocial motives" relating to not wanting to offend the other, wanting to reassure them, and not wanting to appear disloyal (regardless of whether the joke was intended to be unfunny). Further, differences in smiling between conditions were apparently mediated by the associated social motives and display rules.

These results suggest that the expression of "genuine" happiness is mediated by a sharing motive, explaining audience effects on smiling, whereas the camouflaging of negative emotion is mediated by conformity to inhibitory display rules. Whether the former "sharing motive" would count as a facilitatory display rule remains an open question. Unfortunately, although this study attempted to manipulate social motives and display rules by varying joke quality, the supposedly funny joke did not in fact consistently lead to higher positive affect than the supposedly unfunny joke. Further, non-Duchenne smiles were not confined to conditions in which the unfunny joke was delivered but depended also on which of the experimenters' accomplices was the joke-teller. In particular, the female accomplice's delivery tended to lead to more "polite" smiling regardless of how funny or unfunny the joke was designed to be. Because the manipulations were unsuccessful or confounded, then, the mediational results essentially depended on correlational data that provide no definitive evidence about causal priority. The possibility also arises that unmeasured person-specific or gender-relevant social motives explained any effect of emotional content on facial movement rather than the display rules that were explicitly assessed.

More generally, "display rules," "social motives," and even "emotions" do not always seem to represent mutually exclusive categories of phenomena that can easily be manipulated independent of one another. Future studies need to specify more precisely and more comprehensively what motives and norms are relevant to the particular interpersonal situations

under investigation. As argued above, Fridlund's theory as currently articulated does not permit exact predictions about how different social relations might impact on faces. Of course, such indeterminacy might well be an accurate reflection of the complexity and variability of the phenomenon under consideration.

Motive strength. Turning from quality to quantity of emotion, early studies demonstrating sociality effects made little attempt to manipulate emotion intensity in any systematic way. Thus, their findings do not rule out co-determination of expression by emotion and interpersonal context (e.g., Hess et al., 1995; Rodriguez-Mosquera et al., 2000). The exception is Kraut and Johnston's (1979) research, which found little effect on smiling of the relative success of bowlers in attaining strikes or spares, or of the pleasantness of the weather in everyday interactions. As noted above, however, it is by no means certain that strong happiness was induced in any of the sampled situations.

Fridlund's (1991b) study held the nature of the humorous film constant across situations varying in sociality and therefore failed to test for independent effects of emotion on facial movement. Hess et al.'s (1995) extended replication used similar procedures for manipulating sociality but also investigated whether facial reactions depended on how funny the film was. The investigators found that both the emotional power of the film *and* the sociality of the setting influenced muscle movements involved in smiling (orbicularis oculi and zygomatic major). However, these effects only occurred when the (implicit or explicit) co-viewer was a friend, and not when she was a relative stranger.

Jakobs et al. (1999a) similarly found that smiling was influenced both by how funny participants found films and by sociality with a friend as real or imagined co-viewer. Further, they obtained positive correlations between smiling and self-reported positive emotion. The authors argue that these findings present problems for a motive-communicative account because emotion intensity was more closely related to smiling when the viewer was alone, and when supposed social constraints on smiling were at their weakest. However, it might equally be argued that more humorous films were more likely to lead to affiliative social motives and to the imagination of suitable addressees for related messages (indeed, ratings of "social motives" including imagining talking to another person about the film afterwards were highest in the alone condition). In general, it may be that the urge to tell friends about pleasant events becomes greater as the pleasantness of these events increases.

Further evidence based on hierarchical regression analyses showed that there were independent effects of self-reported emotion and social motives on facial movements (and that measured social motives failed to correlate with orbicularis oculi movements). However, the three questions used to index social motives (about awareness of the other and anticipation of

conversation) probably did not provide a sufficiently comprehensive item pool for thorough assessment of this construct (even assuming that it can be adequately measured using self-report). The possibility therefore remains that the emotion items also tapped other unmeasured social motives relating to smile production.

Jakobs, Manstead, and Fischer (1999b) conducted a further study in which friends or strangers read moderately or highly amusing stories to participants face-to-face, via telephone, or on an audio-taped recording. As in their other study, smiling was influenced both by sociality and degree of humour. Further, emotion reports and ratings of social motives varied in complicated ways across experimental conditions. Again, it is hard to draw definitive conclusions based on the mediational analyses given the limitations of the self-report measures. However, the fact that there was significantly more smiling in response to the funnier story even after controlling for self-reported positive affect suggests that so-called emotion intensity effects depend (partly at least) on associated changes in social motives.

A central problems of interpretation for these studies arises from the difficulty of teasing apart emotionality and sociality (e.g., Buck, 1991). On the one hand, increasing the emotional potency of presented material is also likely to influence perceived requirements for communication. On the other hand, introduction of potential audiences, addressees or targets changes the nature of the emotional situation as well as social motives. Without tighter specification of underlying concepts, it may be difficult to arrive at definitive empirical conclusions about their relative contributions to facial conduct.

Summary

Evidence presented above demonstrates that the effects of the real or imagined presence of other people on facial movement depend on a variety of factors, including the relation between the people on the scene, what other people are currently doing, the nature of the event prompting the response, and how strong its impact is on motives or emotions. Under some conditions, the presence of others results in more pronounced or more frequent facial movements, under other conditions in less pronounced or less frequent facial movements. An obvious conclusion is that facial movements are not always facilitated by audience availability. However, only the crudest version of a motive-communication account would ever have made such a prediction.

Many of the direct and moderated effects of other-presence are difficult to explain from the perspective of an unreconstructed emotion-expression account. Indeed, Ekman's theory would require adjustment to explain why sociality seems to impact on supposedly emotional facial movements (e.g., Duchenne smiles) independently of emotionality (e.g., Schneider & Josephs, 1992), and why even strong emotions do not always lead to corresponding facial expressions unless a suitable audience is present (e.g., Fernández-Dols & Ruiz-Belda, 1995).

The motive-communication account's apparent superiority in explaining moderated effects partly derives from the flexibility of its concepts and the fact that no precise conditions are specified under which facial movement will be more or less pronounced. Although there is appropriate acknowledgement that effects depend on the nature of current social motives, and their relation to available addressees, no clear hypotheses about which particular social motives are relevant to which particular relational contexts are provided. Without direct predictions about the form that context-dependence will take under different circumstances, we are left only with plausible post-hoc interpretations requiring independent corroboration.

Recent research by Fischer, Manstead and colleagues (see Fischer, Manstead, & Zaalberg, 2003 for a review) has introduced measures of some of the social motives and display rules thought to be involved in audience facilitation and inhibition. Their testing of mediation using these measures represents an important development. However, retrospective self-reports of social motives and display rules are unlikely to capture fully the operation of the actual processes that operate during interpersonal encounters. These indices therefore need to be validated and supplemented using implicit measures and assessments of facial conduct in other tasks. Manipulations of social motives and of the salience of display rules (e.g., Zaalberg et al., 2004) also represent a promising direction. However, it may be premature to refine operationalization of concepts that are not yet fully specified.

A central problem for Fridlund's approach is that the key concept of "social motive" is so broadly defined. Taken literally, it seems to include everything that people are inclined to do (or want others to do), and to exclude very little of interpersonal life³. Further articulation of the range of possible social motives and their relevance to particular facial movements and particular addressees is needed before motive-communication theory becomes genuinely falsifiable. One useful step would be to clarify relations and distinctions between "social motives" and "emotions," and it is to this issue that I now turn.

Distinguishing Emotions from Social Motives

Fridlund questions the value of "emotions" as explanations by arguing that they are vaguely defined internal entities with uncertain implications for action, much as they were conceived in Darwin's (1873/1998) earlier account (see Ekman, 1997; Russell & Fernández-Dols, 1997). In response, some commentators have contended that "social motives" are similarly underspecified subjective conditions (e.g., Ginsburg, 1997; Izard, 1997). However, Fridlund does not conceive of social motives as intact mental entities that are subsequently read out. In his view, "displays are declarations that signify our trajectory in a given social interaction, that is what we will do in the current situation, or what we would like the other to do. And this 'context' depends considerably not only on the structural features of the situation, but on the succession of interactants' displays

and their responses to them” (Fridlund, 1994, p. 130). In other words, the meaning of facial movements emerges from an ongoing and cumulative interactive context, and is not something that necessarily pre-exists their emergence. Displayers do not experience a social motive or behavioural intention that is then released if a suitable addressee is available; rather, the social motive is implicit in the the displayer’s stance towards the other. For example, you do not necessarily formulate any mental intention to attack before an about-to-aggress display appears on your face. Instead, the beginnings of the action may already be specified as part of your current relationship with the antagonist.

However, “emotions” too may be susceptible to exactly this kind of reformulation. For example, Dewey’s (1894) theory presents them not as ineffable subjective phenomena but rather as part of a process of practical adjustment to the environment. Similarly, Frijda (1986) sees emotion as an intrinsically relational process, and Parkinson (1995: 2001) specifically emphasizes its role in social rather than purely instrumental relations (cf. Campos & Barrett, 1984). From the latter perspective, emotion’s purpose is often precisely to reconfigure interpersonal relationships by communicating appraisals and their associated implications for action (Mead, 1934). Thus, there is no need to assume that an intact appraisal activates an emotional syndrome including facial movement. Instead, emotion may often emerge bottom-up from the pattern of ongoing engagement with changing relational demands. If so, facial conduct is simply one possible aspect of the process of realigning relationships with other people and objects that often, though not always, coalesces into an emotion.

More generally, many psychological definitions of emotion contain explicit assumptions about their role as motivational condition or states of action readiness (e.g., Arnold, 1960; Lazarus, 1991; Roseman, 2001, Scherer, 2001; Smith & Lazarus, 1993). According to these approaches, the presence of emotion necessarily changes the probability that a certain kind of behavior will occur just as a social motive might do (Frijda, 1995). Such an intrinsic association of emotion with action also helps to dispel the criticism that emotion expression can provide no survival advantage (Horstmann, 2003).

In summary, neither social motives nor emotions should be seen purely as private mental states. Both help to motivate action and play themselves out in the course of unfolding transactions. Indeed, many emotions are precisely forms of social motive, and many social motives are emotional (see also Frijda, 1995). This apparent overlap between contemporary conceptualizations implies that researchers should not treat emotions and social motives as directly competing accounts of facial movements. Instead, we need to make more precise predictions about exactly what kinds of social and emotional variables might influence facial movements under different circumstances (Russell et al., 2003).

However, this does not necessarily mean that motive-communication and emotion-expression explanations are simply interchangeable versions of an equivalent theory. At least three substantive distinctions are still important. First, Fridlund's emphasis on communication rather than expression implies that facial movements are not direct responses to either emotions or social motives but instead depend on the real or imagined presence of someone to receive their message. Evidence demonstrating the audience facilitation of smiling is largely consistent with this claim, although data relating to other kinds of facial movement are less definitive. Unless emotions themselves are seen as means of social influence (e.g., Parkinson, 1996), such findings are problematic for exclusively emotional accounts of some facial movements (e.g., Duchenne smiles). Second, it may be that each distinct emotion is not uniquely characterized by a single social motive, but by a range of tactical agendas clustering around a common strategic theme. Assuming that facial movements reflect tactics rather than strategies, the same emotion might then be associated with a range of different facial movements. Although this proposition is compatible with some of Ekman's writings about "emotion families" (e.g., 2001), it is inconsistent with the interpretation of Duchenne smiles as direct expressions of all forms of enjoyment. Third and finally, although emotions often imply social motives, some social motives may be associated with facial movements that are non-emotional. The next section considers this possibility.

Setting Theoretical Parameters

Limits of the Emotion-Expression Account

If emotions typically involve social motives, this helps to explain both why emotion-related facial movements are so readily accommodated within a motive-communication account, and why it is so difficult to manipulate emotion without also affecting social motives. Despite these problems of devising unconfounded emotion inductions, clean and non-emotional manipulations of social motives seem relatively more feasible. For example, research might assess the effect of wanting to make or break contact with another person during routine interactions. Indeed, Kendon (1967) discusses in detail what facial signals are used when interrupting someone or when someone is ready to be interrupted (see also Goodwin, 1980; 1981). However, such facial effects might be seen as conversational moves outside the reach of emotion-expression theories. Similarly, when bowlers smile after turning to face their friends (Kraut & Johnston, 1979), this may reflect politeness rather than emotion (see above).

However, such a defence brings costs. It implies that only a limited subset of facial movements count as emotion expressions, and that other movements such as emblems, illustrators, and referential expressions require separate explanatory principles (e.g., Ekman, 1979). Fridlund's theory, by contrast, has the advantage of parsimony if it can accommodate social and supposedly emotional movements under a single theoretical principle. For example, it readily accounts for both

audience facilitation effects and the impact of what might otherwise appear to be display rules (e.g., Friesen, 1972).

On the other hand, the emotion-expression position might claim the advantage of precision, based on its specification of the particular facial movements that express some specific emotions⁴. For example, Ekman (2001) draws fine-grained distinctions between different kinds of smiles and attributes emotion-revealing power to just one of these, the Duchenne smile (AU6 + AU12). Although these distinctions do not derive from theory in any systematic way, they can still help to tighten predictions.

But how well are these predictions supported? Several studies have demonstrated that smiles tend to be more common or more pronounced when levels of happiness are apparently greater (e.g., Ekman, Friesen, & Ancoli, 1980; Ruch, 1995). However, none of these studies shows an exclusive relationship between happiness and the facial movement claimed to be its unambiguous expression (Bonanno & Keltner, 2004). In most cases where relevant data are reported, Duchenne smiles occur in low- as well as high-happiness conditions. For example, Fox and Davidson (1988) found that 10-month-old girls showed more Duchenne smiles when approached by their mother than by a stranger, but 25% still showed Duchenne smiles in the stranger condition. Schneider and Josephs (1992) actually recorded more rather than fewer Duchenne smiles after failure than success, showing that even a probabilistic link with happiness does not always apply (see also Fernández-Dols, Sánchez, Carrera, & Ruiz-Belda, 1997). Further, Messinger, Fogel, and Dickson's (1999) careful observations reveal how Duchenne smiles emerge from non-Duchenne smiles over the course of behavioural episodes and often change back to non-Duchenne smiles afterwards. The relevant movements seem to be oriented to the specific demands of an ongoing stream of conduct rather than to the natural quality of any underlying emotion. Similarly, Fogel et al. (2000) report that Duchenne smiles are only imperfectly associated with particular varieties of enjoyment.

These data suggest that any correlation between happiness and Duchenne smiling is moderated by a number of variables, including the presence of specific addressees. Ekman's attributions of authenticity to the supposedly canonical expressions of basic emotions therefore seem questionable (e.g., Fernández-Dols & Ruiz-Belda, 1997). In short, happiness does not seem to be a necessary nor sufficient condition for Duchenne smiling, and Duchenne smiling does not provide conclusive evidence that the smiler is happy.

Of course, other unmeasured characteristics of facial conduct may reveal distinctive features that are exclusively associated with emotion. For example, Ekman and Friesen (1982) specify four criteria that distinguish enjoyment smiles in addition to orbicularis oculi activity (synchronization of AU6 and AU12, symmetry, smoothness, and brief duration, see also Frank, Ekman, & Friesen,

1993). More generally, Ekman (e.g., 1989; 2001) argues plausibly that the timing of facial movement and its dynamic relation to ongoing events provide important authenticity cues (see also Tomkins, 1981). However, there is so far little evidence that these criteria correlate perfectly with emotional significance. In short, no research to date has established that *any* specific facial movement has an unambiguously emotional meaning. Thus, no definitive empirical support is yet available for Ekman's basic assumption that some facial movements are direct and spontaneous expressions of emotion.

Although Ekman's theory is often precise about which facial movements are spontaneous expressions of some basic emotions, the emotion-expression relationship is complicated by display rules. About these, Ekman is less specific. More discussion is needed of how different kinds of control process may impact on facial movements in real time. The role of explicit regulation is only part of this story. More implicit norms about facial conduct are also implemented in caregivers' reactions to infants from the earliest stage of development (Saarni, 1990). Children learn when and how it is appropriate to move their faces in certain ways long before they are taught any formal display rules. Furthermore, the ongoing responsivity of others to our emerging facial movements provides immediate feedback that shapes the way that they unfold in addition to any self-regulation.

Limits of the Motive-Communication Account

Instead of claiming one-to-one correspondence between particular social motives and corresponding facial movements, Fridlund (1991a, p. 30) proposes that the specific nature of any display depends on the current social context:

In the behavioral ecology view, instead of there being six or seven displays of 'fundamental emotions' (for example, anger), there may be one dozen or one hundred 'about to aggress' displays. The topography of an 'about to aggress' display may depend on whether the interactant is dominant or non-dominant, conspecific or extraspecific, and whether one is defending territory or young, contesting for access to a female, or retrieving stolen food or property.

Although this may provide an appropriate acknowledgement of the variability and complexity of facial conduct, it begs the question of precisely what facial movements are activated by which social motives at what stages of what kinds of interaction. Further, if the display system needs to be as context-sensitive as implied here, then socialization rather than natural selection starts sounding like the best way of building it (Frijda, 1995). For example, it is hard to imagine an innate mechanism that attunes facial movements to culturally specific gender roles as implied by Hecht and LaFrance's (1998) study. Although Fridlund does not deny ontogenetic influences, they are often seen as an alternative means of ensuring reproductive fitness, rather than exerting conflicting pressures on facial movements. Ekman's neurocultural theory, by contrast, explicitly attributes different roles to phylogeny and ontogeny. The truth may lie somewhere between these extremes, with cultural and biological evolution sometimes working in parallel but sometimes pushing in

divergent directions.

Despite the apparent comprehensiveness of the motive-communication view, like the emotion-expression account, it explicitly excludes facial paralanguage and reflexes (Fridlund, 1994). The problem arising from any exclusion, however, is that it partly undermines the theory's central and most controversial claim that facial displays are designed *only* to communicate motives, since this can now apply to some but not all facial movements, leaving a degree of uncertainty about the functions of excluded instances (see also Frijda, 1995).

One issue here is whether some facial reflexes might be taken as expressions of emotion. As noted earlier, Fridlund dismisses spontaneous and readable facial responses to odors (e.g., Kraut, 1982) as non-affective and therefore irrelevant to either Ekman's theory or his own. But the fact that reflexive withdrawal of sensory organs directly conveys negative evaluation is sufficient to establish the hedonic relevance of this kind of movements (see also Steiner, 1979). In this regard, Fridlund (1991a; 1994), like Ekman (1972), is certainly willing to acknowledge the possibility that some bona fide social-motive displays derive from more primitive reflexes. If so, the dividing line between these two categories of facial movement may begin to seem fuzzier than is often implied.

Setting aside facial reflexes, other facial movements too may be associated with emotion for reasons initially unrelated to their communicative value (Frijda, 1995). For example, Frijda and Tcherkassof (1997) argue that faces often perform actions that directly alter an individual's relation to the environment rather than showing others what that relation might be. Examples are orientational movements of sensory organs, leaning forwards as part of approach or away as part of withdrawal, and the "intention movements" that directly prepare for future actions. Similarly, Dewey (1894) argued that Darwin's so-called expressions often served direct functions as part of the process of adjusting to the environment. If these movements emerge as part of emotional processes independent of any display function, they seem beyond the scope of Fridlund's analysis.

Even facial movements that do serve communicative purposes may simultaneously function as more directly relational activity. As Fridlund acknowledges, motive-communicating faces typically derive signal value from their prior practical effects in survival- or reproduction-relevant encounters. Our ancestors did not fortuitously bare a tooth when another human crossed their turf, instead, they bared it as a preparatory movement in establishing an aggressive posture. Similarly, the other human did not just happen to notice the tooth-baring "signal" but rather was sensitive to it because of its recognized role as part of the same preparatory movement. In this case, tooth-baring certainly communicates a motive but it is one that is already bound up with emotionally relevant transactions with the social environment. Of course, Fridlund might argue, like Darwin, that the original functions of these movements have now become irrelevant and they are now purely ritualized displays. However, many so-called displays continue to serve practical purposes in the

contemporary context (e.g., eye-widening as both signal and implementation of visual attention). Further, in order to preserve their communicative functions, displays may need to maintain connections to the practical actions for which they come to stand (Mead, 1934).

If part of the function of some emotion-connoting faces is practical rather than communicative, these facial movements may be less sensitive to audiences than the motive-communication account suggests. In particular, facial movements that perform direct function (action preparation, perceptual alignment etc) should occur regardless of whether someone is watching. On the other hand, facial movements that have evolved entirely for communicative purposes should be intrinsically sensitive to interpersonal context. Such an account may help to explain why smiles in particular seem most susceptible to audience effects. Because smiling apparently serves no direct practical function apart from its effect on other people, and has plausibly evolved to be perceptually distinctive (Ekman & Hager, 1979), then we would expect this display to be particularly attuned to the presence of potential receivers. More generally, different kinds of facial movements may be more audience-sensitive than others depending on whether or not they carry non-communicative practical functions. Future research should develop more specific hypotheses about which facial movements should be sensitive to audience effects under which circumstances. It seems unlikely that an all-purpose theory that explains all kinds of facial movements using a single principle will ever be viable (Russell et al., 2003).

In sum, Fridlund's claim that faces communicate motives rather than express emotions seems overstretched for two reasons. First, some of the facial movements excluded from the theory may be associated with emotions at some level. Second and more crucially, faces that do specifically communicate, often only become communicative because they also perform practical functions which may also be emotional functions. In Frijda's (1986) terms, facial movements arise as part of action readiness states which are often already intrinsically emotional. Alternatively, emotions may sometimes emerge from relational alignments that include facial movements (Dewey, 1895; Parkinson, 2001; Sorce et al., 1985). Finally, because motive communication seems to cover a variety of ill-defined functions, it becomes hard to determine whether or not emotion expression lies wholly outside its boundaries.

It is also worth noting that there certainly are conventional facial movements that are used to represent emotions in many Western societies (Horstmann, 2003). Indeed, the emotional meanings of canonical expressions are routinely taught in early schooling and reinforced by appropriate pictures in story books and children's movies. All of us quickly learn to convey emotion-relevant meanings by pulling appropriate faces, and this skill becomes close to automatic. In accordance with Ekman's theory, it does not strain credulity to suppose that these faces are sometimes used to cover up displays that carry unwanted emotional connotations because of their association with

either affect or social motive.

Summary

The emotion-expression account explicitly restricts itself to explaining a small subset of facial movements and makes relatively precise predictions about the circumstances under which some of these movements should occur. Some of these predictions have turned out to be false. An area requiring further specification concerns the operation of display rules and control processes more generally. In particular, more attention needs to be given to when and how children learn to regulate their facial conduct, and how interpersonal feedback modulates facial movement in real time. One implication may be that the specific operation of display rules can be clarified by reference to the more general impact of “social motives.”

The only facial movements explicitly excluded from the motive-communication account are facial reflexes and certain aspects of paralanguage. Otherwise its limits are wider and less clearly demarcated. This greater inclusiveness comes at the cost of precision. Although context-dependence of facial movements is a central principle of the model, exactly what contexts will activate which facial movements remains unclear. More generally, the concept of social motive requires further articulation, and the relevance of specific social motives to particular kinds of interaction needs to be clarified. A systematic classification of social motives will allow a better appreciation of their areas of overlap with “emotions.”

Neither theory is intended to be entirely comprehensive. Indeed, despite their obvious disagreements elsewhere, practically all contemporary researchers agree that some facial movements are neither emotional nor related to social motives (e.g., sneezes). Because the emotion-expression view acknowledges that faces do things other than express emotions and the motive-communication view acknowledges that faces do things other than communicate motives, their disagreement concerns only subsets of the category of facial movements. Fridlund argues that the few facial movements that are usually seen as emotion expressions are actually part of a larger set of movements that subserve the display of social motives. Further he doubts that any movement in this latter category *directly* and *inevitably* expresses emotion. Currently available evidence is consistent with this specific claim. When we are experiencing any particular emotion a variety of different things may show on our faces even when display rules appear inapplicable and the influence of contrasting emotions seems implausible (e.g., Fernández-Dols & Ruiz-Belda, 1995). Correspondingly, some emotion-connoting faces also occur independently of the emotion itself (e.g., Schneider & Josephs, 1991). Given these facts, it is hard to maintain that these particular facial movements either map one-to-one onto emotions or carry intrinsic emotional meaning. Emotions are neither necessary nor sufficient conditions for many of the facial movements often considered to be their expressions (Russell & Fernández-Dols, 1997).

However, this does not mean that *no* facial movements are ever emotion expressions. By excluding some classes of facial movement, Fridlund's theory leaves open the possibility that there are faces that are, or can become, linked with emotional processes unrelated to social motives. Further, because the communicative value of specific ritualized facial movements often derives from their prior practical functions, faces that communicate may also serve other functions simultaneously. Abstraction of a *pure* communicative or expressive function for any movement denies important aspects of its phylogenetic and ontogenetic history. To the extent that facial movements continue to be sensitive to their more direct practical context, there is no need to assume that they are always audience sensitive.

Fridlund presents his theory as if it were in direct opposition to Ekman's by emphasizing communicative action addressed to others, rather than expressive symptoms of internal signals. However, these distinctions may be drawn too sharply. First, Fridlund acknowledges that facial displays never just communicate, but always communicate some particular message (see also Hess et al., 1995). In Fridlund's terms, this message relates to social motives, but at least some of these social motives seem coterminous with emotions. Second, Fridlund acknowledges that not all facial movements are displays. The distinctive aspects of his theory, like Ekman's, relate specifically to a delimited subset of facial movements whose precise boundaries are difficult to establish. If many facial movements have mixed origins, serve different purposes, and are not purely about either social motives or emotions, the inclusiveness of both theories becomes questionable.

What do Facial Movements Really Mean?

Different theorists have attributed a wide range of meanings to facial movements, including basic emotions (e.g., Ekman, 1972), dimensions of affect (e.g., Russell, 1997; Woodworth & Schlosberg, 1954), components of emotion (e.g., Ortony & Turner, 1990), appraisals (e.g., Scherer, 1992; Smith & Scott, 1997), action tendencies (e.g., Frijda, 1986), situational trajectories (e.g., Fernández-Dols, 1999), social motives (e.g., Fridlund, 1994), devices for conversational management (e.g., Kendon, 1967), indications of direction of attention (e.g., Rutter, 1987), and so on. Which of them is right, and what is the true meaning of facial conduct? In one sense, all of them may be. Facial movements are clearly capable of providing information relevant to each of these variables.

Even when we turn from the variety of inferences that may be drawn from faces to their intrinsic meaning, no single process can explain their movements across all circumstances (see also Russell et al., 2003). Faces are used in so many ways during social interaction that any essence to their communicative function is hard to distil. It may be that many facial movements have their origins in various practical actions, but that does not necessarily mean that evolution, culture, or some combination of the two have not co-opted them for other uses, so that their action relevance

loses its centrality.

Theorists have tried to get round these complexities by restricting their account to specific types of facial movements or positions. For example, Ekman claims that spontaneous expressions directly reflect basic emotions, but deliberate movements do so less directly, if at all. However, no independently identifiable facial pattern seems to uniquely specify the unadulterated expression of emotion. Further, the spontaneous/deliberate distinction is far from hard and fast, and anyway deliberate movements often do correspond to emotions just as spontaneous ones can relate to non-emotional considerations.

A possible way forward is to abandon the assumption that faces have any essential meaning that applies without reference to the context of their use. Words too are constrained by the anatomy of available muscles and biological capacities for vocalisation, but few would argue that they carry non-arbitrary signification. As Harré and Gillett (1994, pp. 145-146) wrote:

... what are the functions of emotion feelings and displays in the episodes of everyday life? The answer ... is to treat these feelings and displays as being psychologically equivalent to statements. Primitive biological reactions to situations provide the basis of a kind of “vocabulary” of sign forms, in much the way that our nervous system and musculature offer us the wherewithal for making articulated sounds. But the point of giving a speech, say, outlining a program of tax cuts, is not susceptible to a *biological explanation*. It is a situated contribution to a discourse and depends for its effectiveness not only on the use of shared language but on a certain common background of knowledge and belief

In this view, the proper way of understanding facial conduct is to consider what it is intended to achieve in an ongoing interaction. Rather than attributing a specific abstract meaning to any particular facial movement, each one might operate indexically with reference to the current intersubjective context.

However, the analogy between facial positions and words can be overstretched (cf. Mead, 1934). Although it makes sense to analyse an ongoing conversation of gestures with respect to the interpersonal functions and effects of each particular move, it would be a mistake to conclude that all facial conduct has an explicitly rhetorical purpose. Sometimes faces move as a consequence of less articulated processes. Just as the effect of a facial movement does not exclusively depend on its meaning, the mechanisms underlying its production are not sited solely and squarely in the realm of conversational pragmatics.

Does the apparent diversity of possible facial meanings and functions imply that their association with emotions is too weak and contingent to be worthy of theoretical interest? The answer partly depends on how “emotion” is formulated. Because of their apparent sensitivity to social context, it is certainly hard to see facial movements as direct expressions of subjective affect (e.g., Fridlund, 1994, cf. Darwin, 1872/1998). However, they may be more intrinsically involved in the dynamic multilevel processes of adjustment to the practical and social environment that

constitute “emotions” in many contemporary accounts (e.g., Frijda, 1986; Lazarus, 1991; Scherer, 2001).

In my view, facial movements can perform many communicative and pragmatic functions that are central to emotional processes. First, they may be involved in the application of sensory attention to objects (including people), and in conveying information about its direction and intensity to relevant others. Both of these may also be emotional functions (e.g., Smith & Lazarus, 1993). Second, evaluation may be communicated by the persistence and intensity of functionally relevant approach or withdrawal movements towards objects. Third, more specific relational modes may be specified by the characteristics of facial orientations, carrying appraisal implications (Frijda & Tcherkassof, 1997; Smith & Scott, 1997). For example, the combination of visual attention toward a specific object and withdrawal movements away it implies that the object is perceived as a threat. If the object is another person, then this signals an intrinsic social motive. However, if the object is non-social then another person’s reaction to the facial movement may help to constitute and refine the appraisal and associated emotion (*social referencing*, Sorce et al., 1985). In either case, regulation of specific person-object and person-person relations may be achieved partly via the medium of facial movement in emotional situations (cf. Campos & Barrett, 1984). However, it may also be achieved by other means.

Facial communication carries two advantages that make it particularly suitable for some emotional purposes. First, unlike verbal language, which is subject to turn-taking conventions, facial movements can provide a continuous stream of action and information that is attuned (or disattuned) to corresponding streams generated by other people. For this reason, they can respond to, and affect, others’ relational positions on a moment-by-moment basis. One implication is that there needs to be more study of dynamic facial movements rather than static facial positions or configurations (Russell et al., 2003). Second, the connection between faces and some of the actions that they perform is less arbitrary and more direct than that between verbal signifiers and their referential objects. For example, it is difficult to pretend to look at, listen to, or smell something without actually taking in the relevant sensory information. This latter fact partly explains why some facial movements are so compelling as indicators of another’s developing attentional and evaluative stance towards something. Indeed, if someone else is looking intently in a certain direction, our immediate impulse is usually to look there too.

Not only can other people directly pick up my changing orientation towards, and evaluation of, objects from my facial movements, but also I can use (deliberately or otherwise) these same movements to influence their attention and appraisal on-line. To the extent that emotion may be seen as a dynamic process of aligning relations between persons and objects (e.g., Parkinson, 1995), then, nonverbal moves of this kind are often likely to be implicated in its real-time development.

None of this implies that faces always correspond with current emotion. First, not all attentional, evaluative, or action-oriented movements are emotional in quality. Second, the objects of appraisal are not always physical objects to which attention can be explicitly and visibly allocated (e.g., anger about a remembered insult). However, the fact that our earliest emotional encounters in life are with perceptually available others, objects, or both, means that the emotional significance of attentional and evaluative facial movements is likely to be universally learnt, even if it is not already specified innately. Because of their intrinsic links with practical and communicative activities under specific circumstances, facial movements readily acquire consistent conventional meanings.

This paper has argued that there is no set of facial movements whose sole and central purpose is to express emotions. Correspondingly, it would be over-restrictive to argue that an overlapping set of facial movements is designed purely to display social motives. Faces perform a range of different functions simultaneously during interpersonal interaction and the task of research should be to understand how these functions relate to, or conflict with, one another, and how the processes underlying their production may be specified. Pivotal to this task is the appreciation that facial conduct is not simply a one-way process of meaning transmission but rather involves an ongoing adjustment to complementary or competing streams of facial movement from others. Although emotion often guides (e.g., Lazarus, 1991) or emerges from this process (e.g., Dewey, 1895; Parkinson, 2001), its communicative and practical functions may also be served by other means.

Conclusions

This paper has argued that the dependence of facial movement on emotion is less straightforward than implied by an unreconstructed expression account. Emotion does not seem to be a sufficient condition for many of the facial movements that are seen to be its spontaneous expression. When experiencing emotions alone, people do not always make emotional facial movements even though there is no evidence of active inhibition and no-one observing whose presence might invoke display rules. Further, many apparently emotional movements are independently influenced by sociality. Finally, no single facial movement seems to serve as an unambiguous indication of emotion. Although the motive-communication account is capable of accommodating these findings, it does not provide precise predictions about which facial movements should be activated by which social motives in which kinds of interpersonal interactions. The social context impacts on facial conduct in ways that are not reducible to simple audience effects. An important task for social psychology is therefore to articulate the principles underlying the interpersonal modulation of facial movement by reference to their relational basis in real-time dynamic interactions between people. Current concepts of “social motives” or “display

rules” are unlikely to be specific enough to take us very far with this enterprise.

One of the attractions of Fridlund’s theory is that it purports to explain a wide range of facial movements using a single principle. Unfortunately, this conceptual purism has limits. For example, differences between deliberate and automatic movements need to be better specified and explained. However, Ekman’s assumption that spontaneous expressions reflect emotions whereas controlled facial movements reflect display rules and other non-emotional processes is also problematic. Indeed, many cultural conventions about appropriate facial movements may be overlearned, automatic, or implicit. What we feel as well as how we control what we feel usually depends on a combination of processes at different levels, some of which involve emotion, and some of which do not. The task for social psychology is to uncover these processes and their interactions. To achieve this, we need to make tighter predictions and operationalize concepts more precisely. No longer is it sufficient to demonstrate that audiences facilitate or inhibit facial movements under loosely specified circumstances. Rather we should focus on the real-time development of facial movements in relation to emerging appraisals, emotions, and others’ unfolding responses to them.

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Author Note

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Footnotes

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1. In experiment 3, Horstmann replaced this formulation of “behavioral intention” with “what the person is moved to do” and obtained similar results.
 2. Thanks to Alan Fridlund for suggesting this possibility.
 3. A similar criticism might also be applied to emotion-expression theories that claim that everyone is always experiencing at least some level of emotion (e.g., Izard, 1977). Here the motive-communication view might claim the advantage of being potentially able to specify external criteria for the presence of a relevant social motive. I am grateful to Alan Fridlund for this point.
 4. The FACS coding scheme in fact permits a relatively wide range of expressions to indicate some of the emotions that it covers. Thanks to an anonymous reviewer for this point